

DACW-33-85-D-0011 Delivery Order 0010
Hop Brook Dam, Naugatuck, CT

OFFICE COPY DO NOT REMOVE

ATLANTIC TESTING LABORATORIES, LIMITED

Sustaining Member—N.Y.S. Society of Professional Engineers

atl

Box 29
Canton, N.Y. 13617
(315) 386-4578

Box 356
Cicero, N.Y. 13039
(315) 699-5281

May 27, 1986

U. S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

Attn: Mr. Richard D. Reardon

Re: Piezometer Installations and Survey Program
Hop Brook Dam, Naugatuck, CT
Contract DACW-33-85-D-0011
Delivery Order No. 0010
ATL File No. CD011-1-3-86

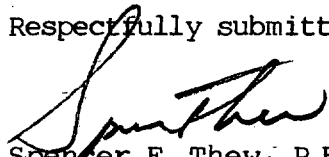
Gentlemen:

Enclosed is one copy of our final report for the referenced project.

By copy of this letter, we are also transmitting two copies to the Chief of the Geotechnical Engineering Branch.

You are welcome to contact our office should you have any questions or comments.

Respectfully submitted,

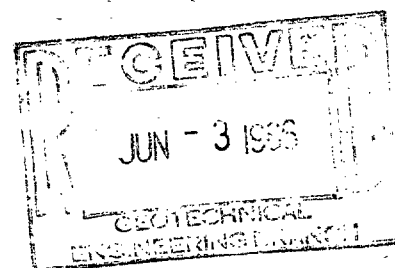


Spencer F. Thew, P.E./L.S.
President

SFT/PMF/smf

2 cc: Chief, Geotechnical Engineering Branch

encs.



SECTION 1

SURVEY, INSPECTION, EXPLORATION
AND
PIEZOMETER INSTALLATION
HOP BROOK DAM
NAUGATUCK, CT

CONTRACT DACW-33-85-D-0011
CONTRACTING OFFICER:
Edward D. Hammond, LTC, CE
28 June 1985

DELIVERY ORDER NO. 0010
19 FEB 1986

PREPARED FOR: U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

PREPARED BY: Paul M. Fisher, P.E.
Atlantic Testing Laboratories, Limited
P. O. Box 29
Canton, NY 13617

April 18, 1986

ATL Report No. CD011-1-4-86

SECTION 2

TABLE OF CONTENTS

SECTION 1	Title Page
SECTION 2	Table of Contents
SECTION 3	Scope of Investigation <ul style="list-style-type: none">a. Delivery Orderb. Project Sitec. Purposed. Scope of Work
SECTION 4	Quality Control <ul style="list-style-type: none">a. General Certification Statementb. Records Takenc. Equipment Usedd. Procedures
SECTION 5	Summary of Activities and Conversation Logs <ul style="list-style-type: none">Table I Summary of ActivitiesTable II Summary of Telephone and On-site Conversations
SECTION 6	Chain of Custody Logs
SECTION 7	Safety Reports
SECTION 8	Field Inspector's Logs <ul style="list-style-type: none">Boring Location SketchDrilling and Well Installation Logs(FD-86-1 thru FD-86-7)
SECTION 9	Other Records Taken <ul style="list-style-type: none">Control Point SketchDye Test Data

SECTION 3

SCOPE OF INVESTIGATION

a. Delivery Order No. 0010

<input type="checkbox"/> CHECKED BOX APPLIES		<input checked="" type="checkbox"/> ORDER FOR SUPPLIES OR SERVICES		<input type="checkbox"/> REQUEST FOR QUOTATIONS NO. RETURN COPIES OF THIS QUOTE BY (THIS IS NOT AN ORDER. See DD Form 1155r)		CD 011		PAGE 1 OF 2					
1 CONTRACT/PURCH ORDER NO DACW33-85-D-0011		2 DELIVERY ORDER NO 0010		3 DATE OF ORDER 26 FEB 78		4 REQUISITION/PURCH REQUEST NO GEB-86-39		5 CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1 DO					
6 ISSUED BY Dept. of the Army New England Division, Corps of Engineers 424 Trapelo Road Waltham, MA 02254-9149 Buyer/Symbol: Herbert/NEOSD-P Phone: 617/647/8207				7 ADMINISTERED BY (If other than 6) CODE		8 DELIVERY FOB <input type="checkbox"/> DEST <input type="checkbox"/> OTHER (See Schedule if other)							
9 CONTRACTOR/QUOTER NAME AND ADDRESS Atlantic Testing Laboratories, Ltd. P.O. Box 29 Canton, NY 13617				FACILITY CODE		10 DELIVER TO FOB POINT BY In accordance with Paragraph 6 of Attachment NET		11 CHECK IF BUSINESS IS <input type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED <input type="checkbox"/> WOMEN-OWNED					
12 SERVICES FOR: U.S. Army Engineer Division, N.E. ATTN: Geotechnical Engineering Branch 424 Trapelo Road Waltham, MA 02254-9149				15 PAYMENT WILL BE MADE BY: Finance & Accounting Officer at issuing office		13 MAIL INVOICES TO Finance & Accounting Officer at issuing office		MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER					
16 TYPE OF ORDER DELIVERY <input checked="" type="checkbox"/> PURCHASE <input type="checkbox"/>		This delivery order is subject to instructions contained on this side of form only and is issued in accordance with and subject to terms and conditions of above numbered contract. in accordance with and subject to terms and conditions of above numbered contract.											
		Reference your General Provisions of Purchase Order on DD Form 1155r (EXCEPT CLAUSE NO. 12 APPLIES ONLY IF THIS BOX <input type="checkbox"/> IS CHECKED, AND NO. 14 IF THIS BOX <input type="checkbox"/> IS CHECKED); special provisions and delivery as indicated. This purchase is negotiated under authority of											
		10 USC 2304(a)(3) or as specified in the schedule if within the U.S., its possessions or Puerto Rico; if otherwise under 2304(a)(6). <input type="checkbox"/> If checked, Additional General Provisions apply; Supplier shall sign "Acceptance" on DD Form 1155r and return copies.											
		17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE 96X3123 06M CE Civil CC112074000K000 (MC) SB GEB AX/PS Coord JH/crk											
18 CONTRACT LINE ITEM NO.		19 SCHEDULE OF SUPPLIES/SERVICES				20 QUANTITY ORDERED/ACCEPTED*		21 UNIT		22 UNIT PRICE		23 AMOUNT	
		Furnish necessary services and equipment for Piezometer Installation and Settlement monitoring at Hop Brook Lake, CT., according to Attachment No. 1				APPROX.						ESTIMATED	
1.2		Geotechnical Inspector				141		HR		\$40.00		\$5,640.00	
1.3		Per Diem - overnight stay				12		Day		45.00		540.00	
1.4		Mileage from Waltham, MA and Return				750		MI		.35		262.50	
*If quantity accepted by the Government is same as quantity ordered, indicate by <input checked="" type="checkbox"/> mark. If different, enter actual quantity accepted below quantity ordered and encircle.				24. UNITED STATES OF AMERICA BY: EDWARD D. HAMMOND, Lt. Colonel, CE Deputy Division Engineer ORDERING OFFICER				25 TOTAL 29 DIFFERENCES 30 INITIALS		\$30,988.00			
26 QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE				27 SHIP NO <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		28 D.O. VOUCHER NO		32 PAID BY		33 AMOUNT VERIFIED CORRECT FOR		34 CHECK NUMBER	
36 I certify this account is correct and proper for payment. DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER				31 PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL						35 BILL OF LADING NO.			
37 RECEIVED AT		38 RECEIVED BY		39 DATE RECEIVED		40 TOTAL CONTAINERS		41 S/R ACCOUNT NUMBER		42 S/R VOUCHER NO			

THIS PARAGRAPH APPLIES ONLY TO QUOTATIONS SUBMITTED:

Supplies are of domestic origin and are sold as indicated by quotation. The Government reserves the right to consider quotations or modifications thereof received after the date indicated should such action be in the interest of the Government. This is a request for information and quotations furnished are not offers. When quoting, complete bid by 11, 12, 22, 23, 25. If you are unable to quote, please advise. This request does not commit the Government to pay any cost incurred in preparation or the submission of the quotation or to procure or contract for supplies or services.

GENERAL PROVISIONS

1. INSPECTION AND ACCEPTANCE - Inspection and acceptance will be at destination, unless otherwise provided. After delivery and acceptance, and after any rejection, risk of loss will be on the Contractor unless loss results from negligence of the United States Government. Notwithstanding the requirements for any Government inspection or test, the Contractor shall perform or have performed the inspection and tests required to substantiate that the supplies and services provided under the contract conform to the drawings, specifications and contract requirements listed herein, including "acceptable the technical requirements for the manufacturing process" as specified herein.

2. VARIATION IN QUANTITY - Variation in the quantity of any item called for by this contract will be accepted unless such variation has been caused by conditions of loading, shipping, or packing, or allowances in manufacturing processes, and then only to the extent, if any, specified elsewhere in this contract.

3. PAYMENTS - Invoices shall be submitted in quadruplicate (one copy shall be marked "Original") unless otherwise specified, and shall contain the following information: Contract or order number, item number, contract description of supplies or services, sizes, quantities, unit prices and extended totals. Bill of lading number and weight of shipment will be shown for shipments on Government Bills of Lading. Unless otherwise specified, payment will be made on partial deliveries accepted by the Government when the amount due on such deliveries is warranted.

4. DISCOUNTS - In connection with any discount offered, time will be computed from date of delivery of the supplies to carrier when acceptance is at the point of origin, or from date of delivery at destination, or point of embarkation when delivery and acceptance are at either of these points, or from the date the correct invoice or voucher is received in the office specified by the Government, if the latter is later than date of delivery. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the Government check.

5. DISPUTES - This contract is governed by the Contract Disputes Act of 1975 (Public Law 94-564, 41 U.S.C. 601-615). The Act provides administrative procedures for the prompt analysis, negotiation, and if necessary, litigation of claims relating to this contract. The parties to this contract must comply with certain time restrictions on rendering of contracting officer decisions on claims, and on the appeal of those decisions. Further details on the rights and remedies under the Act may be found in the DAB at 1514.

6. FOREIGN SUPPLIES - This contract is subject to the Buy American Act (41 U.S.C. 101-105) as implemented by Section VI of the BAP and any restrictions in appropriation acts on the procurement of foreign supplies. The quotation must identify any foreign items to be furnished.

7. CONVICT LABOR - In connection with the performance of work under this contract, the Contractor agrees not to employ any person who is a convict or inmate of any Federal, State, or local prison, or who is a parolee or probationer, as defined by Public Law 94-170, September 10, 1976 (48 U.S.C. 4651-4652) and Executive Order 11755, December 27, 1974.

8. OFFICIALS NOT TO BENEFIT - No member of or Delegate to Congress or resident commissioner shall be admitted to any share or part of the contract, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to the contract if made with a corporation for its general benefit.

9. COVENANT AGAINST CONTINGENT FEES - The Contractor warrants that no person in selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide sales agents or bona fide established commercial or selling agencies authorized by the Contractor for the purpose of selling business. In the event of violation of this warranty, the Government shall have the right to annul the

contract without liability or in its discretion to deduct from the contract price or consideration or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

10. GRATUITIES - (a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found after notice and hearing, by the Secretary or his duly authorized representative, that gratuities in the form of entertainment, gifts or otherwise were offered or given by the Contractor, or any Agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such contract, provided that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court. (b) In the event this contract is terminated as provided in paragraph (a) hereof the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor and (ii) as a penalty in addition to any other damages to which it may be entitled by law to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee. (c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

11. CONDITION FOR ASSIGNMENT - This Purchase Order may not be assigned pursuant to the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), unless or until the supplier has been requested and has accepted this order by executing the Acceptance hereon.

12. COMMERCIAL WARRANTY - The Contractor agrees that the supplies or services furnished under this contract shall be covered by the most favorable commercial warranties the Contractor gives to any customer for such supplies or services and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract.

13. PRIORITIES, ALLOCATIONS, AND ALLOTMENTS - The Contractor shall follow the provisions of DMS Reg. 1, or DFS Reg. 1 and all other applicable regulations and orders of the Bureau of Domestic Commerce in obtaining controlled materials and other products and materials needed to fill this order.

14. FAST PAYMENT PROCEDURE

(a) General. This is a fast payment order. Invoices will be paid on the basis of the Contractor's delivery to a post office, common carrier, or in shipment by other means, to the point of first receipt by the Government.

(b) Responsibility for Supplies. Title to the supplies shall vest in the Government upon delivery to a post office or common carrier for shipment to the specified destination. If shipment is by means other than post office or common carrier, title to the supplies shall vest in the Government upon delivery to the point of first receipt by the Government. Notwithstanding any other provision of the purchase order, the Contractor shall assume all responsibility and risk of loss for supplies (i) not received at destination, (ii) damaged in transit, or (iii) not conforming to purchase requirements. The Contractor shall either replace, repair, or correct such supplies promptly at his expense, provided instructions to do so are furnished by the Contracting Officer within ninety (90) days from the date title to the supplies vests in the Government (180 days for overseas shipment).

(c) Preparation of Invoice

(i) Upon delivery of supplies to a post office, common carrier, or in shipment by other means, the point of first receipt by the Government, the Contractor shall prepare an invoice in accordance with clause 3 of the General Provisions of Purchase Order, except that invoices under a blanket purchase agreement shall be prepared in accordance with the provisions of the agreement. All invoices shall be prominently marked "Fast Pay".

(ii) If the purchase price excludes the cost of transportation, the Contractor shall also for the prepaid shipping cost of the invoice as a separate item. The cost of parcel post insurance will not be paid by the Government. If transportation charges are separately stated on the invoice, the Contractor agrees to retain related paid freight bills or other transportation billings paid separately for a period of three (3) years and to furnish such bills to the Government when requested for audit purposes.

(iii) In the event this order requires the preparation of a Material Inspection and Receiving Report (DD Form 200), the Contractor has the option of either preparing the DD Form 200 or including the following information on the invoice, in addition to that required in (i), (ii) above: (A) a statement in prominent letter

NO DD 200 PREPARED; (B) shipment number, (C) mode of shipment, and (D) at location level, (1) National Stock Number (if applicable), (2) part number, (3) unit of measure, (4) Ship To Point, (5) Mark For Point if in contract, and (6) MILSTRIP document number if in contract. When a DD Form 200 is not required, the invoice will include the following information: (1) Ship To Point, (2) Mark For Point and MILSTRIP document number if in contract, as well as the information in (i), (ii) above. In all cases where a DD Form 200 is prepared, a copy of the invoice will be included in each shipment.

(d) Certification of Invoice. The Contractor agrees that the submission of an invoice to the Government for payment is a certification that the supplies (for which the Government is being billed) have been shipped or delivered in accordance with shipping instructions issued by the ordering officer, in the quantities shown on the invoice, and that such supplies are in the quantity and of the quality designated by the cited purchase order.

OUTER SHIPPING CONTAINERS SHALL BE MARKED "FAST PAY"

15. (This clause applies if this contract is for supplies and is not exempted by applicable regulations of the Department of Labor.)

SERVICE CONTRACT ACT OF 1965 - Would apply to the extent that an exemption, variation or tolerance would apply pursuant to 29 CFR 4.6 if this were a contract in excess of \$2,500. The Contractor and any subcontractor hereunder shall pay all of his employees engaged in performing work on the contract not less than the minimum wage specified under section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended (current minimum wage). However, in cases where section 6(c)(2) of the Fair Labor Standards Act of 1938 is applicable, the rates specified there will apply. All regulations and interpretations of the Service Contract Act of 1965 expressed in 29 CFR Part 4 are hereby incorporated by reference in this contract.

ADDITIONAL GENERAL PROVISIONS

16. CHANGES - The Contracting Officer may at any time, by a written order, and without notice to the sureties, make changes within the general scope of this contract, in (i) drawings, designs or specifications, where the supplies to be furnished are to be specially manufactured for the Government in accordance therewith; (ii) method of shipment or packing; and (iii) place of delivery. If any such change causes an increase or decrease in the cost of, or the time required for performance of this contract, whether changed or not changed by any such order, an equitable adjustment shall be made by written modification of this contract. Any claim by the Contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the Contractor of the notification of change provided that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim if asserted prior to final payment under this contract. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes". However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

17. TERMINATION FOR DEFAULT - The Contracting Officer, by written notice, may terminate this contract, in whole or in part, for failure of the Contractor to perform any of the provisions hereof. In such event, the Contractor shall be liable for damages, including the excess cost of procuring similar supplies or services, provided that, if (i) it is determined for any reason that the Contractor was not in default or (ii) the Contractor's failure to perform is without his and his subcontractor's control, fault or negligence, the termination shall be deemed to be a termination for convenience under paragraph 18. As used in this provision the term "subcontractor" and "subcontracting" means subcontracting at any tier.

18. TERMINATION FOR CONVENIENCE - The Contracting Officer, by written notice, may terminate this contract, in whole or in part, when it is in the best interest of the Government. If this contract is for supplies and is so terminated, the Contractor shall be compensated in accordance with Section VIII of the Defense Acquisition Regulation in effect on this contract. (a) In the event that this contract is for services and is so terminated, the Government shall be liable only for payment in accordance with the payment provisions of this contract for services rendered prior to the effective date of termination.

19. ASSIGNMENT OF CLAIMS - Claims for monies due to be made by the Contractor shall be assigned only pursuant to the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15). However, payments to an assignee of monies under this contract shall not, in any event, be provided in such amount as to be subject to deduction or set off of the Claims Act.

ACCEPTANCE

THE CONTRACTOR HEREBY ACCEPTS THE ORDER REPRESENTED BY THE NONERELI PURCHASE ORDER AS IT MAY BE MODIFIED, HAVING BEEN ORIGINALLY SUBMITTED SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR	SIGNATURE	TYPE NAME AND TITLE	DATE SIGNED

CONTINUATION SHEET

REF. NO. OF DOC. BEING CONT'D.

Delivery Order 0010 to
DACW33-83-D-0011

PAGE

OF

2

2

NAME OF OFFEROR OR CONTRACTOR

ATLANTIC TESTING LABORATORIES, LTD.

ITEM NO.	SUPPLIES/SERVICES	QUANTITY APPROX.	UNIT	UNIT PRICE	AMOUNT ESTIMATED
2.1	Geotechnical Report	1	JOB	60% of 1.2	\$3,384.00
3.1	Mobilization and Demobilization	8	JOB	\$180.00	1,440.00
3.2	Mileage from/to Waltham, MA	2000	MI	.35	700.00
3.4	Survey Crew and Equipment	9	DAY	440.00	3,960.00
3.5	Overnight Per Diem for Survey Crew	8	DAY	90.00	720.00
3.6	Data Reduction and Plotting	1	JOB	100% of 3.4	3,960.00
3.7	Standby Time	8	HR	55.00	440.00
6.1	Mobilization and Demobilization	2	JOB	700.00	1,400.00
6.2	Mileage from/to Waltham, MA.	500	MI	1.15	575.00
6.5	Standby Time/on site moves	34	HR	75.00	2,550.00
7.1	Mobilization and Demobilization	1	JOB	450.00	450.00
7.2	Mileage From/to Waltham, MA.	250	MI	1.15	287.50
7.5	Standby Time	60	HR	50.00	3,000.00
14.1	0-50 Ft. Depth	140	LF	22.00	3,080.00
14.2	51-150 Ft. Depth	103	LF	40.00	4,120.00
18.2	XH and 6-inch Size	243	LF	28.00	6,804.00
20.2	Pipe (3" I.D., 1/4" wall)	50	LF	5.50	275.00
22.3	NWX Size and/or NWM	50	LF	45.00	2,250.00
24.1	Casagrande Type 0-50 Ft. Depth	183	LF	15.00	2,745.00
24.2	Casagrande Type, over 50 Ft. Depth	105	LF	17.00	1,785.00
30.1	Light Lumber for shoring	1	MBF	620.00	620.00

ATTACHMENT NO. 1

GEB REQUISITION NO. 86-39 - DACW33-85-D-0011

DELIVERY ORDER NO. 10

SURVEY, INSPECTION, EXPLORATION AND PIEZOMETER

INSTALLATION INSTRUCTION

PROJECT: Piezometer Installation & Surveying Program

SITE: Hop Brook Dam, Naugatuck, CT.

PROPOSE: Locate by survey and install piezometers to determine phreatic surface, pore pressures, and average permeabilities of the foundation. Layout survey points and monitor movements on the downstream depression area.

1. SCOPE OF INVESTIGATION.

a. General

Survey and install five piezometers (as shown on attachment #2) on the crest, slope, and left abutment of the dam. Test borings (FD-A, C&D) shall be located by survey. The borings shall be located both horizontally and vertically. Features of the dam shall be used for horizontal control (e.g. Dam Sta. 4+60 = e.g. Outlet conduit Sta. 4+60) and crest monuments shall be used for vertical control (ele. 380.93 monument No. 4). The survey crew shall be mobilized a total of eight times for boring location, grid installation, and six monitoring surveys.

b. Test Boring For Piezometer

(1) Test boring location for borings FD-A through FD-E (as shown on attachment No. 2) shall be located by survey crew. Borings FD-A & FD-C are along the conduit and care shall be taken to avoid driving through conduit.

(2) The test boring shall be advanced and sampled as indicated on attachment No. 2 and as outlined in the contract specifications.

(3) Casagrande open-type piezometers or other approved type shall be installed in accordance with paragraph 24, page C-26. Casing shall be driven to the bottom of the hole and wash out prior to piezometer installation. For the piezometer installations, a ten (10) foot piece of 3" casing or pipe shall be left in place and threaded cap provided.

(4) To accomplish this program two drill rigs & crews and a drill crew without equipment (for slope holes) will be mobilized.

(5) One geotechnical inspector shall act as a field inspector while performing the borings and installing piezometers. The inspector shall provide telephone reports to Mr. Blair, Corps of Engineers, at 617-647-8396 at least every two working days or completion of each boring (prior to piezometer installation).

(6) All samples shall be delivered to the Corps of Engineers Headquarters in Waltham, MA by the field inspector. Sample delivery shall be coordinated with the Director, NED Materials and Water Quality Laboratory at 617-647-8367/8392.

c. Survey Plan and Schedule

(1) The 20'x40' depression (see attachment No. 2) along the outlet conduit shall be monitored for vertical movements by survey crew once a month for a six months period.

(2) A 30'x50' grid of 5ft. long reinforcing bar (3/4" ϕ) shall be installed in the area of the depression. The 24 reinforcing bars shall be spaced 10ft. o.c. and shall stick up about 2ft. The top two feet of the bar shall be painted with fluorescent paint and flagged.

(3) A vertical control point (drill hole) shall be established on the head wall of the outlet conduit during initial survey. This control point shall be used as a bench mark for subsequent surveys.

2. SITE CONDITIONS.

The site is Hop Brook Dam, a Corps of Engineers dam in Naugatuck, CT. (see Attachment 2). The drilling operations will be performed along the crest, mid-slope, and the abutment of the dam as indicated on attachments 2.

The site shall be returned to it's pre-work condition upon completion. Also, the project manager must approve the site condition prior to demobilizations.

3. RIGHTS OF ENTRY.

The geotechnical inspector shall notify the Project Manager at the dam at 203-729-8840.

4. COORDINATION.

The work shall start as soon as possible. The geotechnical inspector shall report on how work is progressing and what types of material are being encountered.

5. EXPLORATION.

The drive sampling borings designated FD-A through FD-E located on attachment 2 shall be numbered FD-86-1 through FD-86-5 in order of their completion. The new numbers shall be indicated on the exploration logs and shown on a plan of explorations.

6. COMPLETION SCHEDULE.

Duration of field work is estimated to be 15 work days. The geotechnical report shall be submitted in draft format for review by the Government no later than fourteen calendar days after completion of the drill portion of the field work. Review will take approximately ten calendar days from receipt of draft report. The final geotechnical report shall be submitted no later than seven calendar days after receipt of draft report including the action taken on possible comments.

The data from the survey portion of this delivery order shall be submitted two days after survey and include in a complete survey data report at completion of the delivery order.

7. QUALITY CONTROL.

You will be held responsible for the quality of the maps submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level effort required for that submission, (b) elimination of conflicts, errors and omissions, and (c) the overall professional and technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.

HOP BROOK DAM PIEZOMETER INSTALLATION

HOLE NUMBER	STATION	OFFSET	TYPE OF BORING	APPROXIMATE ELE. OF TIP	ELEVATION/DEPTH TO 4 FT SEAL	TOTAL DEPTH OF HOLE	SIZE OF BIT/SAMPLER	ELEVATION TOP OF CONDUIT	ELEVATION TOP OF HOLE
FD-A	6+50(CONDUIT)	4 FT LEFT	300 LBS-CONTINUOUS	285.00	ELE 290 *	24 FT	3" SAMPLER	284.35	308.00
FD-B	5+30(DAM)	155 FT D/S	NI-SIZE CORING	285.00	ELE 310 **	41 FT	NI-SIZE		325.00
FD-C	4+65(CONDUIT)	0 ft	300 LBS-CONTINUOUS	296.00	ELE 330 ***	96 FT	3" SAMPLER	293.6	381.00
FD-D	3+55(DAM)	11.5 FT D/S	300 LBS-CONTINUOUS	275.00	ELE 285 ***	107 FT	3" SAMPLER		381.00
FD-E	4+63(DAM)	240 FT D/S	300 LBS-CONTINUOUS	270.00	ELE 280 ***	16 FT	3" SAMPLER		285.00

* SEAL TO BE PLACED AT INTERFACE OF COMPACTED GRAVEL FILL AND PROCESSED SAND FILL.

** SEAL TO BE PLACED TEN FEET BELOW BEDROCK SURFACE.

*** SEAL TO BE PLACED AT INTERFACE OF COMPACTED RANDOM FILL AND ORIGINAL GROUND.

1) REFUSAL IS DEFINED AS 100 BLOWS/6" FOR FIRST 31.25 INCHES AND 60 BLOWS/6" FOR THE NEXT FOOT.

2) A 2.5" SOLID SAMPLE SPOON SHALL BE USED FOR SAMPLING IN THE SOIL.

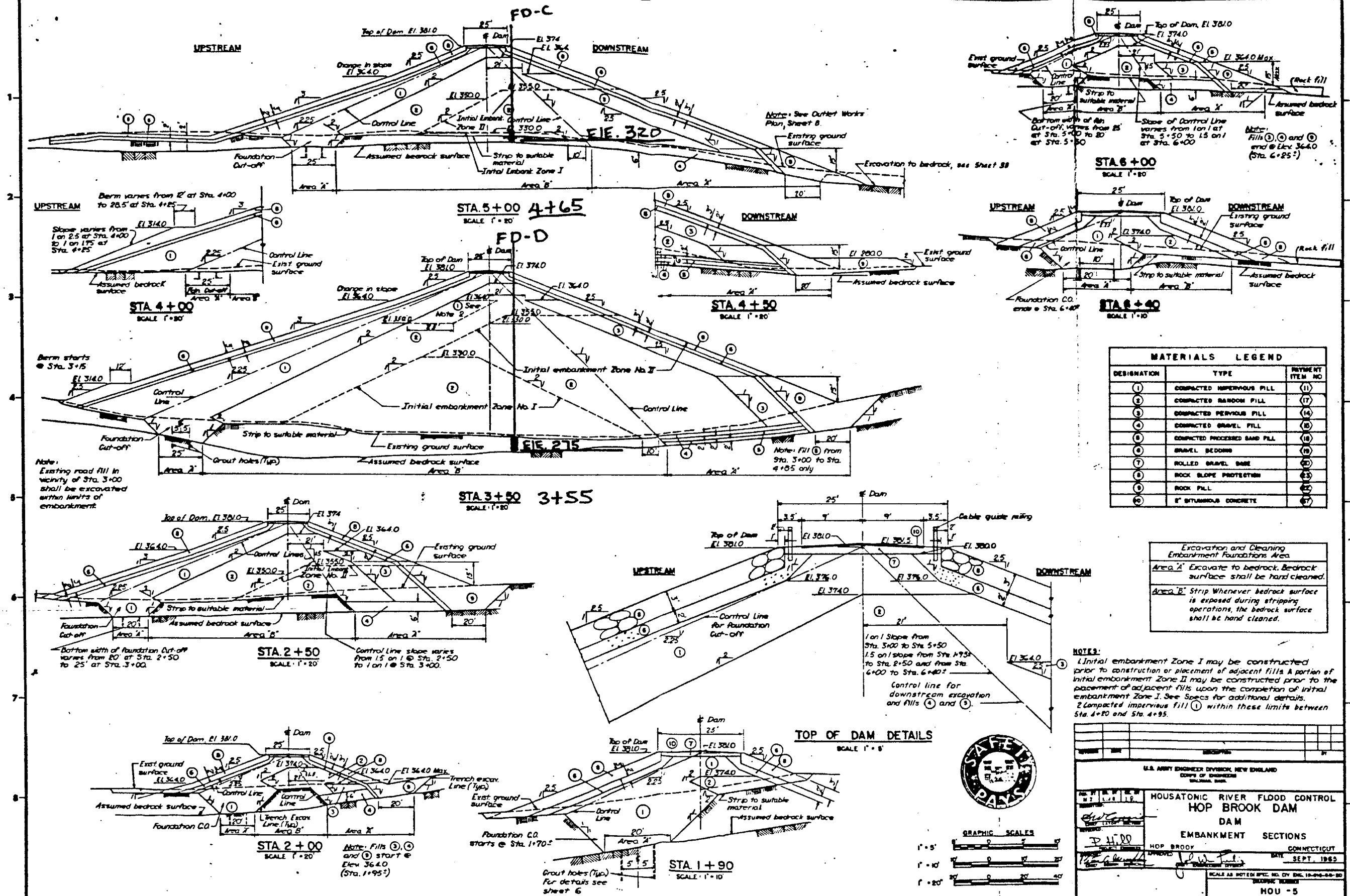
3) FD-B SHALL BE LOCATED ON THE LEFT ABUTMENT (START DRILLING ON ROCK).

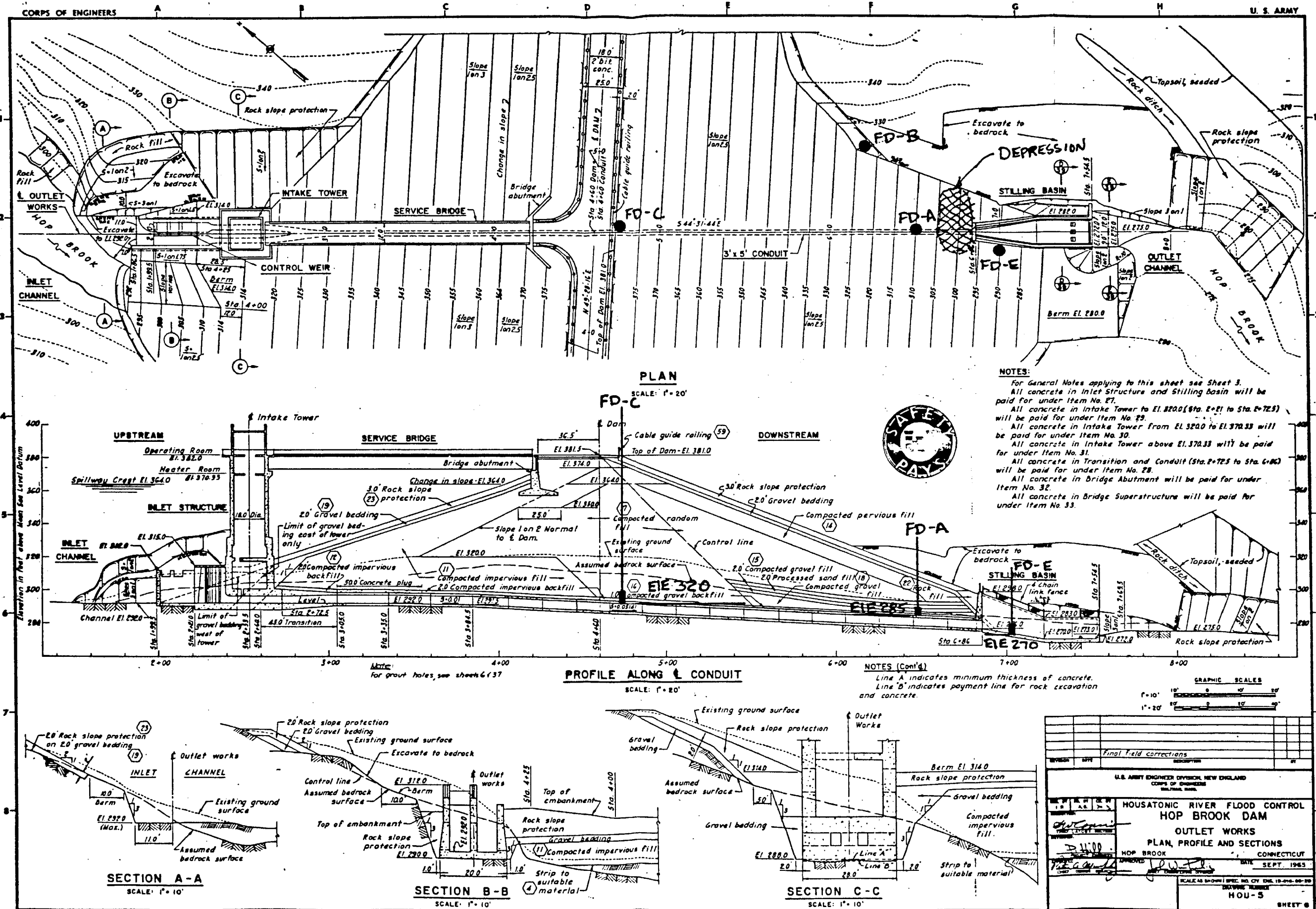
4) FD-C PIEZOMETER TIP SHALL BE LOCATED ONE FOOT ABOVE THE CONDUIT.

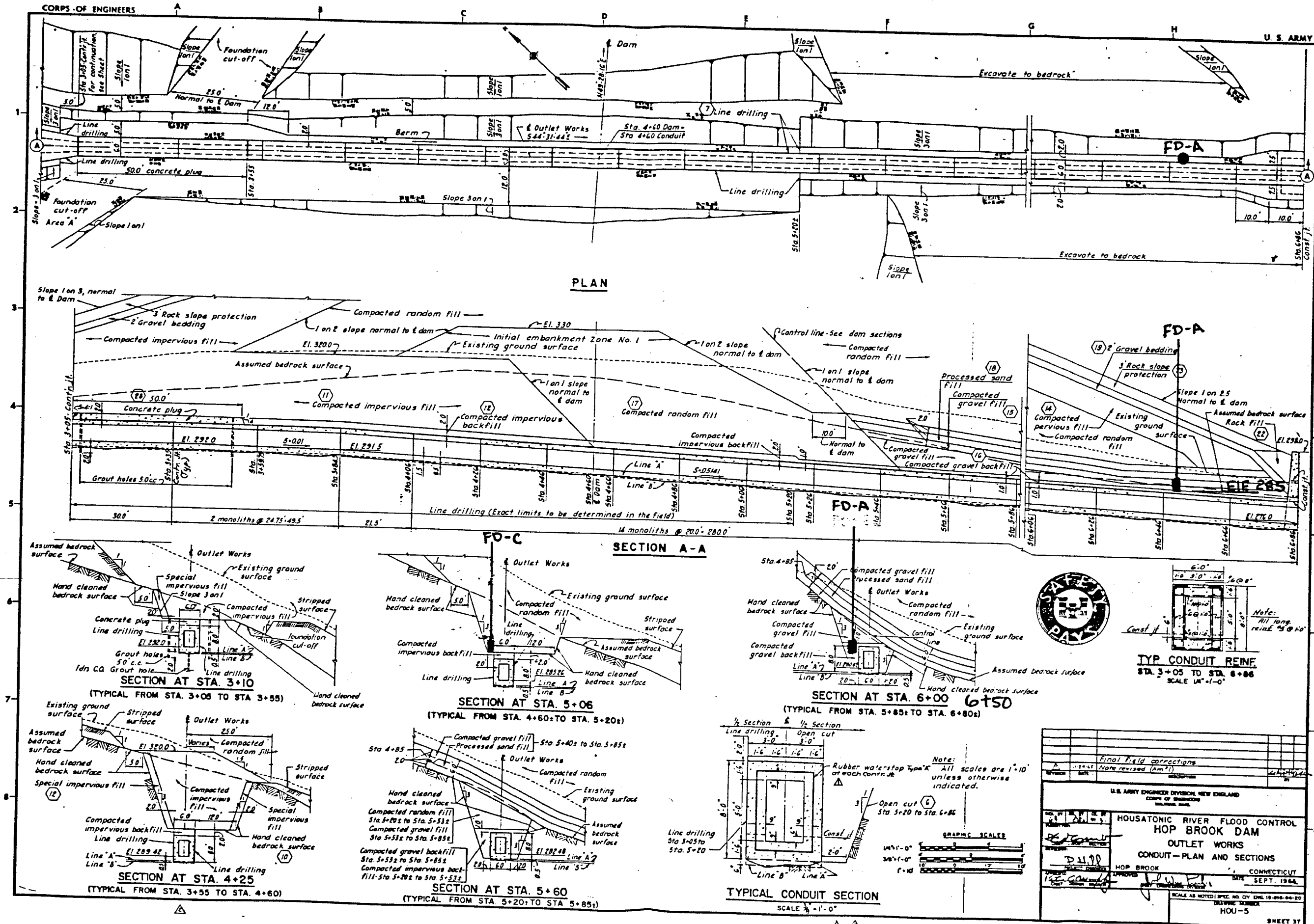
5) FD-D AND FD-E SHALL BE DRIVEN TO BEDROCK AND DRILLED ONE FOOT INTO ROCK.

THE PIEZOMETER TIPS SHALL BE SET ONE FOOT ABOVE THE BEDROCK SURFACE.

ATTACHMENT 2 SHEET 1 OF 5







SECTION 3a

GEB Requisition No. 86-39-DACW-33-85-D-0011

Delivery Order No. 0010, Addendum 1

Piezometer Dye Test Instructions

Hop Brook Dam

Naugatuck, CT

This addendum is to serve as a formal delivery order as instructed by the Corps of Engineers. Atlantic Testing Laboratories acted upon the April 1, 1986, telephone call and arrived on site April 2, 1986 to perform the referenced dye piezometer testing. All requirements and instructions were followed from telephone conversations with John Hart and Jim Blair of the Corps of Engineers. These conversations and ATL's activities are included in Section 5.

b. Project Site

The project is at the site of a flood control dam, containing the waters from Hop Brook in Naugatuck, CT. The investigation covered an area from the dam's crest to the outlet toe. Boulder sized rip rap, on 2.5:1 slope, covered the work area, therefore, special equipment was required to access a majority of boring locations. A boring location drawing has been included in Section 8. General plans of the dam facility, as provided to us in the Delivery Order, are in part (a) of this section.

c. Purpose

The purpose of the exploration was to recover soil samples for classification and install observation wells to monitor the phreatic surface within the dam. Information retrieved from the wells will aid in determining water movement through the dam and furthermore, assist in developing an understanding of the depression area, which has appeared on the downward face of the dam. This information is in the form of soil types, water level readings and dye tests. A survey grid was layed out just above the outlet structure to documentate slope movement at the depression area.

d. Scope of Work

The scope of work under this Delivery Order primarily consisted of installation of 7 observation wells on the downstream slope of Hop Brook Dam. Originally, 5 wells were planned in the Delivery Order. The 2 additional wells were requested and performed during the scheduled work. Drilling, sampling and well installation at the referenced site was performed by Atlantic Testing Laboratories employees using Atlantic Testing Laboratories equipment.

General inspection, exploration and well installation instruction were provided by the Army Corps of Engineers, New England Division, through the contracted "Specifications for Services and Equipment Necessary for Conducting Geotechnical Exploratory work, Various Locations in New England, and New York" and through Delivery Order No. 0010 which was included in Section 3a. Specific instructions and changes during the course of work were given verbally during on site and phone conversations through a Corps of Engineer representative. All new instructions and changes can be found listed in Table I and Table II of Section 5, herewith.

Horizontal and vertical control of the observation wells and the initial vertical control of the depression grid was conducted by Atlantic Testing Laboratories' surveyors. This information was referenced to an on site monument (#4 as instructed). The surveyors will return to the site for the next five consecutive months to re-elevate the depression grid and note any movement.

A dye test was later performed on some of the installed wells during high pool stage. This work was conducted per verbal information received from the Corps, which has been included in Section 5.

SECTION 4

QUALITY CONTROL

a. General Certification Statement

I hereby certify that the above mentioned records, equipment and procedures were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the delivery order. This report has been subject to my review and is both complete and technically accurate.

CERTIFIED 18 April 1986


Spencer F. Thew, P.E./L.S.

b. Records Taken

A Geotechnical Engineer was on site from February 17, 1986 to March 21, 1986, to log daily activities. Furthermore, said engineer recorded survey, drilling, installation and testing information as they occurred. A dye test on certain wells was conducted by an ATL Geotechnical Engineer and Geohydrologist from April 2 to 9, 1986.

Pertinent drilling procedures, sampling operations, soil classifications, and testing data were noted on the following forms provided for use by the Corps of Engineers:

- NED 121 (Field Log of Test Boring, Summary)
- NED 58 (Field Log of Test Borings, Log Construction Page)
- NED 59 (Subsurface Water Observations)
- NED 130 (Field Log of Test Boring in rock)

Information outlining the installed well characteristics were noted on Piezometer Installation Report, Monitor Well Installation Detail, and Dye Test Results forms. A completed series of logs for each of the wells, along with location drawings are included in Section 8. Sample containers were marked in the format provided to us in the Contract using Form 1742 where applicable. All soil and rock samples were delivered to Waltham, MA on March 21, 1986, as instructed.

Summary of daily activities and telephone conversations can be found in Tables I and II of Section 5. Also documented during the project operations were a chain of custody log and 6 safety meeting reports, located in Sections 6 and 7, respectively. Note that exposure time for ATL, Corps and subcontracted personnel were included on the safety meeting reports.

c. Equipment Used

All equipment and supplies were provided by Atlantic Testing Laboratories, Limited, with exception to that provided by the subcontractors. A listing of pertinent equipment follows:

1. Survey Equipment

- Wild Heerburg, T-1, 6 minute theodolite
- Wild Heerburg, NAK1, automatic level
- 25 feet, extendable, fiberglass, stadia rod
- 100 feet and 200 feet survey chain
- David White hand level
- fluorescent paint

2. Drilling Equipment

- Tandem axle, truck-mounted CME 75 drill rig
- CME 45 drill rig mounted on skids
- Drill rod, NX taper threaded in 2 feet, 5 feet, and 10 feet lengths; used for sampling and turning 3-7/8 inch roller bit
- Auger, 4-1/4 inch ID, 8 inch OD, slot fit, hollow stem augers in 2 feet and 5 feet lengths with carbide tip teeth
- Three 1-1/2 inch centrifical pumps with 500 feet fire hose

- One 175 gallon tub, one 80 gallon tub and one 30 gallon tub
- A 6 inch OD by 3 foot diamond bit core barrel; 3 inch OD by 5 foot diamond bit core barrel; 1-1/2 inch OD by 5 foot diamond bit core barrel
- Split spoon samplers, 2-3/8 inch ID by 2 foot in length
- Drilling platform, approximately 8 feet by 12 feet, was constructed of 2 inch by 10 inch rough cut timber planks placed on a frame of 4 inches by 4 inches and 6 inches by 8 inches timber beams; 2 inches by 4 inches, timbers were used for bracing

3. Well Supplies

- Porous plastic well screen 1 inch ID by 2 feet length
- Threaded 3/4 inch ID Schedule 80 PVC riser pipe in 5 feet and 10 feet lengths
- Filter sand, #2 in 100 pound bags
- Bentonite well seal, 3/8 inch diameter peltonite
- Backfill material was bulk concrete sand
- Well protector, 2 inch and 3 inch diameter by 10 feet long black iron pipe threaded to accept a vented pipe cap

4. Well Test Equipment

- 100 foot electronic water level indicator
- Standard watch
- Formulabs Fluorescent Dye Tablets (yellow and red)

5. Subcontracted Equipment

- International diesel tow truck, with two drums, 3/4 inch cables, with operator
- Mobile welder with operator

d. Procedures

Seven observation wells were installed on the 2.5:1 downstream rock slope of the Hop Brook Dam. This involved surveying well locations, building and placing equipment on platforms, drilling and sampling through the dam embankment followed by observation wells installation and testing.

1. Survey Procedures

Three Atlantic Testing Laboratories, Limited Surveyors were on site February 17-18, 1986, to run closed traverse from the given Bench Mark #4 (EL380.93 feet), on the dam crest, to the top of the outlet headwall, elevated at 297.83 feet. The intersection of the outlet works (conduit) centerline and centerline of the road on the dam crest was set by measuring the road center and using the theodolite to sight on the inlet and outlet structures. A P.K. nail was driven in the roadway and designated as Station 4+60 of the dam and Station 4+60 of the conduit. These stations were as noted from the as-built embankment plan in the delivery order.

With the above baseline information, the surveyors were able to set and elevate the proposed well locations as described in the delivery order. The surveyors returned to the site, on March 12, 13, 14, 1986, to acquire as-built information of the installed wells. At this time, a settlement grid was layed out to monitor movement of the downstream face, just above the outlet headwall. The grid points consisted of a fluorescent orange X painted on a stable boulder, with a chisel mark in the center. An initial

elevation was recorded to be followed by 5 consecutive monthly sets of readings. A grid location sketch and table of initial readings have been included in Section 9.

2. Access Procedures

Two wells were installed at the edge of the dam crest. These were accessed by disconnecting the guard rail wire and backing the truck mounted CME 75 drill rig to the edge and setting up.

The wells on the dam slope required construction of a platform to set and operate the CME 45 skid drill rig. The platform material was hand carried down slope. The founding 6 inches by 8 inches timbers were placed directly on the boulder rip rap and keyed into the slope with use of number 6 (3/4 inch) rebar. Timbers (6 inches by 8 inches and 4 inches by 4 inches) were crossed horizontally to provide a level frame. Planking (2 inches by 10 inches) were tightly nailed producing a level work area. Bracing was added using 2 inches by 4 inches timbers.

The CME 45 skid drill was equipped with a self-contained winch, with 5/8 inch cable, which was used to move the rig down slope. A winch line, from the subcontracted wrecker, was used as a safety line during down slope movement. The wrecker, located on the dam crest, was implemented to move the rig up slope and to retrieve drilling appurtenances and platform materials at completion.

Enough material was brought to the site to allow construction of two platforms. While the rig was in operation on one platform, the other was being disassembled, moved, and reassembled at the next proposed well location.

3. Drilling Procedures

A truck-mounted drill rig (CME 75) was employed to advance two holes on the edge of the dam crest. Due to the nature of the slope, 2.5:1 rock face, a second rig (CME 45), mounted on skids, was required.

Sampling techniques, as described in the Contract, were followed and involved retrieving material using the "Standard Penetration Test". A 3 inch O.D. split spoon was driven 2.0 ft, and the blow counts for a 300 lb. hammer falling 18 inches were recorded for every 0.5 ft advancement. Refusal was defined as 100+ blows for the first 0.5 ft and 60+ blows per 0.5 ft for the remaining spoon drive.

Samples were classified in the field in accordance with ASTM D-2488, without qualifying laboratory tests. Representative samples were taken from each soil sampling run and placed in two 16 oz. jars with hermetically sealed lids. Jars were labeled with the sticker (Form 1742) provided to us by the Corps. A chain of custody log was maintained documenting custody of the samples between Atlantic Testing Laboratories and the Corps of Engineers.

Both drill rigs (CME 45 and CME 75) used on-site were equipped to handle several different methods of drilling. Different techniques of advancing each hole, in conjunction with sampling, were employed to best suit the situation. These systems and their effectiveness are generally described as follows:

Use of flight augers, which were limited in depth of penetration due to cobbly material; four inch drive casing, preceded with 3-7/8 inch roller bit, which also demonstrated difficulties advancing through cobble; four inch spin casing preceded by a 3-7/8 inch roller bit, this worked best when only the upper portion of the hole was cased and the remainder drilled using a 3-7/8 inch roller bit washed with recirculated Clear Mud and water mixture in the open hole.

Rock coring, using diamond bits washed with water, was performed where applicable. The 6 inch barrel was used at some locations to penetrate the boulder rip rap at the surface and the smaller core barrels were used to sample bedrock and concrete. Drilling with the use of compressed air was not permitted.

Specific drilling procedures for each well have been recorded on the boring logs contained in Section 8.

4. Well Installation Procedures

Once the boring had been advanced to the required depth the Clear Mud, if used, was deactivated using Clorox and the drill rods removed. The 2 ft long porous plastic screen and 3/4 inch PVC riser pipe were connected and lowered to the determined depth as direction by the Corps of Engineers. The #2 filter sand was added, followed by a 4 ft thick bentonite seal (3/8" peltonite). FD-86-4 was the only well installed that did not have this seal, per request. The remainder of the open hole was filled with on-site soil and/or bulk concrete sand. A 3-inch diameter by 10 ft long pipe was placed around the 3/4 inch riser pipe for protection. The protective pipe was concreted in place allowing a 2 ft to 3 ft stick up. This was secured with a pipe cap vented by a 1/8 inch hole.

5. Well Testing Procedures

A falling head test, as described in the contract, was performed on each well shortly after installation. This required pouring water down the riser pipe, attempting to fill the pipe and measuring the water surface drop against time. The depth was measured using an electronic water level indicator at 1, 5, 10, and 30 minute increments. All well tests, except FD-86-7, displayed good results, signifying an accurate monitor of the

water table. FD-86-7 was slow in recovering and thought to have a concentration of drill mud absorbed in the gravelly sand formation. Additional Clorox was added to the well to break down the drill mud. although, FD-86-7 was not retested, daily readings improved after the Clorox was added.

Atlantic Testing Laboratories was requested to return to Hop Brook Dam on April 2, 1986, and conduct a series of dye tests on the recently ATL installed observation wells. Time was limited to conduct these tests due to the need to lower the pool elevation to normal stage. The Corps of Engineers had originally scheduled the dye test in a particular sequence: FD-86-2, FD-86-6, FD-86-1, and FD-86-7. Testing was terminated on April 9, 1986, with dye injected in only the first two scheduled observation wells.

Yellow dye was placed in Well FD-86-2 on four occasions by crushing one to three dye tablets, mixing with one quart of water, then pouring down the 3/4 inch riser pipe. This was followed by several quarts of water to flush the dye out of the well tip. An observer watched for signs of the dye at the dam toe, rock fractures and a headwall weep hole. Generally, the observer was in place most of the daylight hours, but no dye was noted.

Red dye was added to well FD-86-6 twice in the same manner, as reported above, with similar results - no dye detected. Actual dye inducing and observation procedures were logged and have been incorporated in Section 9.

Under the guidance of the Corps, several techniques were attempted. These included increasing dye concentration, adding extra water down the riser pipe forcing the dye into the formation, altering the time at which the dye was induced and reducing the flow through the outlet structure.

SECTION 5

**SUMMARY OF ACTIVITIES
AND
CONVERSATION LOGS**

TABLE I

SUMMARY OF ACTIVITIES

<u>Date</u>	<u>Activity</u>
17 Feb	<p>Monday: Time on site 12:30-16:00</p> <ul style="list-style-type: none"> - Mobilize Geotechnical Inspector to site. - Mobilize three ATL Surveyors to site. - Surveyors set stakes and recorded elevations for Wells FD-A, FD-C and FD-D - Mobilized CME 45 and CME 75 drill rigs to Waterbury, CT from Canton, NY. - Met with Dam Project Manager, Les Butler, to review procedures and requirements of project.
18 Feb	<p>Tuesday: Time on site 08:00-16:30</p> <ul style="list-style-type: none"> - Three ATL Surveyors on site 09:00-10:30, set stakes for wells FD-B and FD-E, recorded elevations, demobilized to Canton, NY. - CME 45, CME 75 and 5 drillers on site 08:00-1600. - Stand by time, 3.5 hrs each rig for equipment and moving; .5 hr for safety meeting.
19 Feb	<p>Wednesday: Time on site 07:00-16:00</p> <ul style="list-style-type: none"> - CME 45 (3-man crew) hand-carried equipment and supplies down dam slope; built platform for rig over Boring FD-A. - CME 75 crew moved rock rip rap to allow drilling. - CME 75 advanced 4-1/4" ID augers 0-50 ft, continuous sampling in FD-C (FD-86-1). - Stand by time, 12.5 hrs on site move.
20 Feb	<p>Thursday: Time on site 07:00-17:30</p> <ul style="list-style-type: none"> - CME 45 (3 man crew) set up to move rig down dam slope, transported equipment down slope to FD-A (FD-86-2). - CME 75 continued drilling FD-86-1; set up 2 pumps and hoses; installed 4" drive casing in FD-86-1 to 50 ft. - Stand by time, 14 hrs for on site moves.
21 Feb	<p>Friday: Time on site 07:00-16:30</p> <ul style="list-style-type: none"> - CME 45 (3 man crew) moved equipment down slope, started platform for FD-E (FD-86-4). - CME 75 readjusted pumps and hoses; advanced 4" casing from 50 to 60 ft in FD-85-1. - Jim Blair, Army Corps, on site 11:00-13:00. - Stand by time, 4.5 hours for on site moves.
24 Feb	<p>Monday: Time on site 12:00-18:00</p> <ul style="list-style-type: none"> - CME 45 (3 man crew) set up pump and hoses; carried drill steel down slope to FD-A (FD-86-2); carried wood down slope to FD-E (FD-86-4) for platform. - CME 75 continued advancing 4" casing from 60 to 74 ft in FD-86-1.

<u>Date</u>	<u>Activity</u>
25 Feb	<p>Tuesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - Held safety meeting. - CME 45 (2 man crew) advanced FD-86-2 from 0-14 ft utilizing 6" core to advance 7 ft into rock rip rap then 4" drive casing. - Extra Driller completed platform over FD-E (FD-86-4). - CME 75 continued advancing FD-85-1 from 74 to 87 ft (top of conduit; helped carry lumber. - Stand by time, 9.5 hrs on site moves and safety meeting.
26 Feb	<p>Wednesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - CME 45 continued advancing FD-86-2 from 14 to 21 ft; on something hard at 21 ft; 1.5 hrs. stand by awaiting Corps decision regarding advancement. - CME 75 supply pick up, 1 hr. - CME 75 installed well in FD-86-1; moved equipment to FD-D (FD-86-3). - Stand by time, 2.5 hrs on site moves.
27 Feb	<p>Thursday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - CME 45 advanced FD-86-2 21 to 27 ft; 1 hr stand by time for Corps decision; cored 27 to 32 ft; installed well; moved equipment. - CME 75 crew moved boulder at FD-D and moved equipment; started drilling FG-86-3 (FD-D) 0-20 ft; rig maintenance. - Jim Blair, Chris Allery and John Szarek of the Army Corps were on site 10:30-13:00. - Stand by time, 6 hrs on site moves.
28 Feb	<p>Friday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - CME 45 and equipment moved from FD-A (FD-86-2) to FD-E. - Wrecker on site 08:00-10:30. - Extra Driller helped move CME 45; disassembled FD-86-2 platform. - CME 75 rig maintenance. - Stand by time, 12 hrs on site moves.
3 Mar	<p>Monday: Time on site 10:00-17:00</p> <ul style="list-style-type: none"> - CME 45 continued advancing FD-86-4 from 7 to 15 ft (10-15 ft core). - CME 75 crew built platform for FD-B (FD-86-5). - Stand by time, 4.5 hrs on site moves.
4 Mar	<p>Tuesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - Safety meeting held. - CME 45 continued to core FD-85-4 from 15 to 17 ft; set well; started move from FD-3 (FD-86-4) to FD-B. - Wrecker on site for move. - CME 75, rig maintenance; continued to auger FD-85-3 from 20 to 40 ft; assisted with move of CME 45. - Stand by time, 8.5 hrs on site moves and safety meeting.

<u>Date</u>	<u>Activity</u>
5 Mar	<p>Wednesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - Wrecker on site to move CME 45. - CME 45 finished move from FD-86-4 to FD-B (FD-86-5); started NX coring from 0-8 ft in FD-86-5. - CME 75 continued advancing FD-86-3, switching from auger to 4" roller bit and utilizing Clear Mud from 40 to 104 ft; assisted in move of CME 45.
6 Mar	<p>Thursday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - Jim Blair, Army Corps, on site 10:30-14:00. - CME 45 continued coring rock in FD-86-5 from 8 to 20 ft; set well; dismantled FD-86-4 platform and started moving supplied up slope to FD-F location. - CME 75 continued advancing FD-86-3 from 104 to 105.5 ft; set well; ready for demobilization; helped move CME 45 platform. - Stand by time, 6.5 hrs on site moves.
7 Mar	<p>Friday: Time on site 07:00-1630</p> <ul style="list-style-type: none"> - 3 drillers continued to move materials and supplies; built platform for FD-F (FD-86-6) . - Stand by time, 4.5 hrs for on site move.
10 Mar	<p>Monday: Time on site 10:30-17:00</p> <ul style="list-style-type: none"> - 3 drillers finished building platform for FD-F (FD-86-6). - Vandalism to equipment occurred over the weekend. - Falling head test run on FD-86-3, FD-86-4 and FD-86-5. - Stand by time, 2.5 hrs for on site moves.
11 Mar	<p>Tuesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - CME 45 moved from FD-86-5 to FD-86-6; advanced FD-86-6 0-10 ft. - Wrecker on site 07:30-11:00. - Jim Boyer, driller, fell on rock slope while carrying 2x4's at 13:30 hrs, was taken to Waterbury Hospital and was released with diagnosis of strained back.
12 Mar	<p>Wednesday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - CME 45 continued advancing FD-86-6 from 10 to 35 ft, encountered numerous boulders and cobbles. - ATL Surveyors on site 13:30-16:00, started final survey.
13 Mar	<p>Thursday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - CME 45 continued advancing FD-86-6 from 35 to 56.5 ft, rained out 11:00-12:00 (1 hr stand by time, 3 men); drilling continued 12:30-16:30. - Surveyors constructed platform for FD-G; rained out 11:00-12:00 (1 hr stand by, 2 men); 12:30-15:00 continued platform; 15:00-16:30 set horizontal control of observation wells.
14 Mar	<p>Friday: Time on site 07:00-14:00</p> <ul style="list-style-type: none"> - Surveyors finalized locating wells and depression grid. - CME 45 continued advancing FD-86-6 from 56.5 to 58.5 ft; possible concrete conduit. - Paul L'Heureux, Army Corps, on site 10:30-13:00.

<u>Date</u>	<u>Activity</u>
17 Mar	<p>Monday: Time on site 09:30-17:00</p> <ul style="list-style-type: none"> - CME 45 cored FD-86-6 from 58.5 to 59.0 ft and retrieved concrete sample; diamond bit had metal particle on it and was badly damaged signifying drilling into rebar; placed on stand by 15:00-16:30 awaiting Corps decision. - Les Butler, Army Corps, shut dam gate down and walked inside of the conduit, no damage was noted from drilling.
18 Mar	<p>Tuesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - Safety meeting held. - CME 45 wet well for FD-86-6; moved equipment from FD-86-6 to FD-86-7; advanced FD-86-7 0-4 ft. - Wrecker on site 13:00-14:30 as subcontractor. - Stand by time, 4.5 hrs for on site moves and safety meeting.
19 Mar	<p>Wednesday: Time on site 07:00-18:00</p> <ul style="list-style-type: none"> - CME 45 on stand by 07:00-10:00 due to rain; continued FD-86-7 from 12 to 40.5 ft; worked through lunch; difficult drilling due to cobble. - Extra driller arrived on site with hauler and trailer, 14:00-17:30, started site clean up; took apart FD-86-6 platform. - Stand by time, 3.5 hrs for on site moves.
20 Mar	<p>Thursday: Time on site 07:00-17:30</p> <ul style="list-style-type: none"> - CME 45 continued to advance FD-86-7 from 40.5 to 69.5 ft; installed well; picked up equipment and moved drill rig from platform to dam crest. - Wrecker on site 07:00-17:30. - Extra driller on site 07:00-17:30 cleaned up site. - Stand by time, 12 hrs for on site moves.
21 Mar	<p>Friday: Time on site 07:00-12:00</p> <ul style="list-style-type: none"> - 3-man crew picked up site and loaded equipment. - Demobilized all ATL equipment and personnel from Hop Brook Dam at 12:00. - Delivered all soil and rock samples to Waltham, MA at 15:00 hrs. - Stand by time, 4.5 hrs for on site moves.
2 Apr	<p>Wednesday: Time on site 08:00-16:30</p> <ul style="list-style-type: none"> - Mobilized Engineer from Syracuse to Naugatuck, CT, last night, 1 April 86. - On-site to start dye test program of installed observation wells. - Added one crushed yellow dye tablet and one quart water to FD-86-2, plus 3 quarts water at 09:52; took dye reading the remainder of the day, no trace due to high tail water. - Opened gates to lower pool elevation approximately 9 ft; this created high tail water and very difficult to detect dye coming from dam toe.

<u>Date</u>	<u>Activity</u>
3 Apr	<p>Thursday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - Dam outlet gates shut down to approximately 50 cfs, pool at 30.3 ft. - Added yellow dye to FD-86-2 at 08:15, no dye noticed for 8 hr observation.
4 Apr	<p>Friday: Time on site 07:00-17:00</p> <ul style="list-style-type: none"> - Added yellow dye to FD-86-2 at 07:07. - Added red dye to FD-86-6 at 07:28. - Reduced flow through outlet to 24 cfs. - Jerry Fairley on site 12:30-17:00. - No dye observed coming from dam toe today from 07:30 to 17:00 and at 19:00 hrs.
5 Apr	<p>Saturday: Time on site 06:50-18:00</p> <ul style="list-style-type: none"> - Arrived dam at 06:50, took piezometer readings; pool - 30.2 ft, spillway - 0.1 ft. - Watched for dye all day, logged in at 1 hr. intervals; no dye was observed. - Added 3 crushed dye tablets mixed with water to FD-86-2 (yellow tablets) and FD-86-6 (red tablets). Left site at 18:00, no dye was observed all day. Weep hole running just a trickle today.
6 Apr	<p>Sunday: Time on site 07:00-16:30</p> <ul style="list-style-type: none"> - Arrived on site at 07:00; pool - 30.7 ft; spillway - 0.2 ft. - Watched for dye all day, logging in at 1 hr. intervals; left site at 16:30. No dye was observed all day. Weep hole was partially under water today.
7 Apr	<p>Monday: Time on site 07:00-19:00</p> <ul style="list-style-type: none"> - Arrived on site at 07:00, gate open to 0.5 ft. - Noted different subsidence (2 ft - 3 ft). This depression is only really apparent when standing at the toe of the slope, to the right side of dam. - 15:00 added water to piezometers FD-86-2 and FD-86-6, as requested. Results = 8 gallons (approximately) added to FD-86-2; 5 gallons (approximatey) added to FD-86-6 which filled the piezometers to the top. - 18:30 added water to piezometers in similar quantities and with similar results, to earlier. Left site at 19:00, due to darkness could not see dye. Weep hole was completely under water today. No dye was observed all day.
8 Apr	<p>Tuesday: On site 06:00-19:00</p> <ul style="list-style-type: none"> - Arrived at dam at 06:00, pool = 30.5 ft, spillway open to 0.5 ft. - Repeated applications of water to piezometers (as per yesterday). This was done at 16:00 (8 gallons in FD-86-2 and 5 gallons in FD-86-6) with similar results. - Left site at 19:00 due to darkness, could not see dye. Weep hole still under water. No dye was observed today.

Date

Activity

9 Apr

Wednesday: On site 06:00-15:00

- Arrived at site at 06:00; pool = 29.8 ft, gates closed to 0.3 ft.
- Watched for dye until 15:00, logging hourly, with no dye observed.
- Weep hole only partially submerged today.
- End dye test, demobilize from site.

TABLE II

SUMMARY OF TELEPHONE AND ON-SITE CONVERSATIONS

<u>Date</u>	<u>Conversation</u>
12 Feb	<p>Wednesday:</p> <p>On site - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Pre-work meeting to review job requirements. - Discussed dam access, laydown area, 3" protective pipe for wells, compressed air cannot be used, can use water and revert for drilling, survey required immediately.
14 Feb	<p>Friday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Use 3/4" I.D. PVC and 2 ft long porous plastic tip for all wells. - Delivery order is being processed.
18 Feb	<p>Tuesday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Location and installation procedures of the 5 proposed wells. - Can use hollow stem augers. - Must use 300 lb hammer for sampling. <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - I asked if a subcontracted wrecker could be employed to lower skid rig down slope.
19 Feb	<p>Wednesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Well installation procedure for FD-86-1. - Need delivery order. - Okay to use wrecker to assist skid rig. - Moving rip rap is stand by time. - Refusal is determined as 100+ blow per first 6" sampling and 60+ blow per each remaining 6". - Move FD-A (FD-86-2) 4 ft left of center.
20 Feb	<p>Thursday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Will visit site tomorrow. - Bring well installation instructions.
21 Feb	<p>Friday:</p> <p>On site - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Soil sampling is not required in Boring FD-86-3 except a 10 ft zone at the piezometer tip. - Use standard pipe caps instead of lock caps on permanent surface casing.

<u>Date</u>	<u>Conversation</u>
25 Feb	<p>Tuesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Explained stand by/on site move time. - Will send delivery order by mail. - Installation requirements for FD-86-1, 2' seal, 2' sand then well tips.
26 Feb	<p>Wednesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Rock or concrete at 21 ft okay for drilling to advance.
27 Feb	<p>Thursday:</p> <p>On site - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Drill FD-86-2 to 32 ft depth. - Can use Clear Mud and open hole drilling. - Only sample from 92 to 107 ft in FD-86-3, drill 1 ft into rock, set well tip 2 ft from bottom.
3 Mar	<p>Monday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Regarding location of the two new additional wells (FD-F and FD-G).
4 Mar	<p>Tuesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Set final tip depth of FD-86-4 at 17 ft. - Location information for FD-F and FD-G (new wells).
5 Mar	<p>Wednesday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Core FD-86-5 to 20 ft depth. - Set FD-86-5 well tip 1 ft from bottom. <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Sample continuously in FD-86-3 from 92 ft to termination unless sampling becomes difficult and/or fruitless.
6 Mar	<p>Thursday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Set FD-86-3 well tip 1 ft above rock, sand to 15 ft above rock then 4 ft seal. <p>On site - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Confirmed location and depth of new wells, FD-F and FD-G. - Use point and chisel marks on rock instead of driven rebar for the survey grid above the outlet structure.
11 Mar	<p>Tuesday:</p> <p>Telephone - John Hart (Corps)</p> <ul style="list-style-type: none"> - Requested a separate written summary with regards to drilling methodology.
12 Mar	<p>Wednesday:</p> <p>Telephone - Naugatuck Police</p> <ul style="list-style-type: none"> - Regarding vandalism to ATL equipment over the past two weekends.

<u>Date</u>	<u>Conversation</u>
14 Mar	<p>Friday:</p> <p>On site - Paul L'Heureux (Corps)</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Regarding drilling into outlet conduit at FD-86-6, decision will be made Monday.
17 Mar	<p>Monday:</p> <p>Telephone - Paul L'Heureux (Corps)</p> <ul style="list-style-type: none"> - Go ahead to core a minimal depth to assure that FD-86-6 was into concrete. <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Regarding FD-86-6, no repair to conduit required, set well tip 1 ft above concrete, sand to 13 ft above concrete then 4 ft seal.
19 Mar	<p>Wednesday:</p> <p>Telephone - Terry Wong (Corps)</p> <ul style="list-style-type: none"> - Well installed in FD-86-6. - Moved drill rig to FD-86-7. <p>On site - Les Butler (Corps)</p> <ul style="list-style-type: none"> - Looked over site regarding final check. - Can leave sand and gravel piles.
25 Mar	<p>Tuesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Request a copy of all logs be sent to Corps. - Add well sketch to each log.
26 Mar	<p>Wednesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Relayed station, offset for each well. - Relayed all well top and tip elevations.
27 Mar	<p>Thursday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Noted bad water level readings from FD-86-7, try adding Clorox.
1 Apr	<p>Tuesday:</p> <p>Telephone - Jim Blair (Corps) and John Hart (Corps)</p> <ul style="list-style-type: none"> - A formal request to ATL to perform an immediate dye test on installed wells at Hop Brook Dam. - Start dye test tomorrow, April 2, 1986 at 08:00 hrs. - Testing order: <ul style="list-style-type: none"> FD-86-2 with 1 tablet of yellow dye FD-86-6 with 2 tablets of yellow dye FD-86-1 with 2 tablets of yellow dye FD-86-7 with 2 tablets of yellow dye - Observe at least every hour. - Change all Hop Brook boring logs from 1" = 5' scale to 1" = 2'. Invoice Corps for this extra.

<u>Date</u>	<u>Conversation</u>
2 Apr	<p>Wednesday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Dam gates have been opened and will be difficult to detect dye. - Change dye sequence to yellow in FD-86-2, red in FD-86-6, yellow in FD-86-1, red in FD-86-7 and yellow in FD-86-3. - Wait for color to dissipate before starting new test.
3 Apr	<p>Thursday:</p> <p>Telephone - John Hart (Corps)</p> <ul style="list-style-type: none"> - Requested ATL on site Saturday and Sunday, April 4-5, 1986. - Jerry Fairley, ATL, scheduled on site tomorrow and for the remainder of testing. - Instructed to add dye to FD-86-2 again, plus add dye to FD-86-6 tomorrow morning.
4 Apr	<p>Friday:</p> <p>Telephone - John Hart (Corps)</p> <ul style="list-style-type: none"> - Dye in FD-86-2 and FD-86-6. - I requested to reduce flow from outlet. - Observe dye until Saturday afternoon, then add 2 tablets of yellow to FD-86-2 and 3 tablets of red to FD-86-6. - Can observe dye a few occasions at night with caution.
7 Apr	<p>Monday:</p> <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Noticed a possible second depression. - Include dye test in main Hop Brook Dam report. <p>Telephone - John Hart (Corps)</p> <ul style="list-style-type: none"> - Add 5-10 gallons of water to FD-86-2 and FD-86-6.
8 Apr	<p>Tuesday:</p> <p>Telephone - John Hart (Corps)</p> <ul style="list-style-type: none"> - ATL suggested using dye traps. - No dye noticed yet. <p>Telephone - Jim Blair (Corps)</p> <ul style="list-style-type: none"> - Repeat application of water down riser.

SECTION 6

CHAIN OF CUSTODY LOG



atl

ATLANTIC TESTING LABORATORIES, Limited

CHAIN OF CUSTODY LOG

PROJECT:

HOP BROOK DAM, DACW-33-85-D-0011
D.O.# 010

ITEMS:

Tubes

NONE

Bottles

NONE

Jar Samples

7 BOXES (12/BOX)

Core Boxes

2

Sampling Logs

NONE

Date & Time Received

Date & Time Transferred

Comments

Custodian

3:30 21 March 86

AS SAMPLED

(ATL)
PAUL FISHER

NEDED-2

Paul Fisher
Hornet Kroule

SECTION 7

SAFETY REPORTS

WEEKLY SAFETY MEETING

NEDSO

Date held 2/18/86

THRU: Area Engineer, NEW ENGLAND Area

Time 0900

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. OKN 33-85-0-0011 Contractor ATLANTIC TESTING LAB

Conducted By FISHER All personnel present (Contr) 6
(Sub) 0
(Govt) 0

Subjects discussed (Note, delete, or add):
EM 385-1-1, Section: _____

Accident Prevention Plan POST TELEPHONE No. OF HOSPITAL, POLICE ETC

Individual Protective Equipment - HARD HATS + GLOVES + BOOTS

Prevention of Falls - 2.5 TO 1 SLOPES ON DAM

Back Injury, Safe Lifting Techniques - HAULING EQUIPMENT + SUPPLIES.

Fire Prevention - UP + DOWN SLOPE

Sanitation, First Aid, Waste Disposal -

Tripping Hazards - trash, hose, nails in lumber - SLOPE

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Inspection & Maintenance (Zero Defects) - 2 RIGS

Hoisting Equipment - 2 RIGS

Ropes, Hooks, Chains and Slings -

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

Loose Rock and Steep Slopes -

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

2. Forwarded.

CF:

Prepared by FISHER Title ENG.

Signature

[Signature]
Resident Engineer

WEEKLY SAFETY MEETING

FOR THE CONSTRUCTION INDUSTRY

Week of

Company Name ATLANTIC TESTING LAB Job Name HOP BROOK DAM Date 2/18/86

SHORTCUTS

Working in the construction industry most of you have the unique opportunity to 'DO YOUR OWN THING' -- which means the freedom to perform the work based on your past experience, sound judgment and creative thinking.

The old saying "There's more than one way to skin a cat" really applies to our industry, because of the many different ways to accomplish a specific task or an entire job.

To be successful in your job you must become proficient in the art of taking GOOD shortcuts, but never forget this -- shortcuts are good only if they are well planned to save time, effort, or expense, without sacrificing SAFETY or QUALITY.

The term 'shortcut' has gained a bad reputation over the years as a result of spur-of-the-moment brainstorming, poor judgment and flash decisions, without any regard for personal or long range safety, or the quality of the finished product.

You can't afford the risk. Information recently released from the U.S. Department of Labor revealed that the reported cases of deaths, injuries and illnesses in the work place rose 12% to 5.4 million cases in 1984. In the construction industry accident rates are sky-high, and YOU are the only ones that can improve the statistics.

Remember -- the next time you come up with a brilliant idea for a shortcut, make sure that it's safe and sound. After all, saving time, effort, and money is insignificant if you or anyone else, is killed, injured, or becomes ill in the process.

SAFETY REMINDERS

TAKING DANGEROUS CHANCES CAN BE THE FASTEST WAY
TO SHORTCUT YOUR CAREER OR MAYBE YOUR LIFE.

Special Topics For Your Project SAFE TECHNIQUE TO LOWER DRILL
RIG DOWN SLOPE

Employee Safety Recommendations SAFETY ROPE FOR CLIMBING SLOPE

Meeting Attended By

PAUL FISHER

MIKE HANKINS

PAUL DAVIS

TODD BURHAM

RAMON TORD

JOHN SARRINEN

Supervisors Signature

[Signature]

WEEKLY SAFETY MEETING

NEDSO

Date held 2/25/86THRU: Area Engineer, NEW ENGLAND AreaTime 1000

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DALW33-85-0-0011 Contractor ATLANTIC TESTING LABConducted By PAUL FISHER All personnel present (Contr) 6(Sub) 0Subjects discussed (Note, delete, or add): (Govt) 0

EM 385-1-1, Section: _____

Accident Prevention Plan

Individual Protective Equipment - HARD HAT, GLOVES & BOOTSPrevention of Falls - 2.5 TO 1 SLOPE DAMBack Injury, Safe Lifting Techniques - CARRYING TIMBER & TOOL UP & DOWNFire Prevention - EXTINGUISHERS IN TRUCKSanitation, First Aid, Waste Disposal - IN TRUCK

Tripping Hazards - trash, hose, nails in lumber -

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -Equipment Inspection & Maintenance (Zero Defects) - CME 45 + CME 75 DRILL RIGSHoisting Equipment - DRILL RIGSRopes, Hooks, Chains and Slings - WIRE ROPE

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

Loose Rock and Steep Slopes - 2.5 TO 1 SLOPE DAM

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

Prepared by FISHER Title ENG

2. Forwarded.

CF: EXPOSURE TIME FOR 2/17 - 2/21/86 Signature Paul Fisher
ATL 209 HRS
CORPS 2
Resident EngineerNED FL 251 SUB 2 1/2
APR 82

NO WEEKEND WORK

WEEKLY SAFETY MEETING

FOR THE CONSTRUCTION INDUSTRY

Company Name ATLANTIC TESTING LAB Job Name HOP BROOK DAM Date 2/25/86

FOOT PROTECTION

The average person takes approximately 18,000 steps daily and there's the possibility of a foot injury with each step.

Construction jobs can be hazardous to your feet -- nail punctures are common -- walking on uneven ground, over materials and tools, or slipping on oil, grease, ice, snow, etc. can result in foot injuries, or sprained ankles -- foot fatigue can develop from prolonged standing on ladders, walking on re-bar, stone, etc.

Your job is no place for dress, casual, or tennis shoes -- your feet need the protection of a sturdy work shoe, maintained in good condition.

Concrete, cement powder, or any other chemical entering your shoe or boot can damage the tender skin of the ankle and foot very quickly. Other foot injuries result from chemicals that soak through the shoes causing skin irritation or serious injury.

Construction work is often performed under wet or damp conditions -- overshoes are important to help keep your feet dry, warm, and protected from chemical contact.

Be extremely cautious of your feet and toes when working around heavy equipment, material stockpiles, and while placing or moving heavy loads.

Most foot injuries are caused by objects falling or rolling onto the foot -- safety shoes can reduce the injury from these types of accidents, and they are recommended for most workers. In recent years, safety shoe construction has become stronger, lighter, and more comfortable to wear than ever before -- try them.

SAFETY REMINDERS

PROMPT FIRST AID FOR MINOR INJURIES
CAN PREVENT MAJOR COMPLICATIONS

Special Topics For Your Project CLIMBING ROCK COVERED SLOPE

Employee Safety Recommendations

Meeting Attended By

PAUL FISHER

MIKE HAWKINS

PAUL DAVIS

TODD BURHAM

RANDY TODD

JOHN SAARINEN

Supervisors Signature

WEEKLY SAFETY MEETING

NEDSO

Date held 3-4-86THRU: Area Engineer, NEW ENGLAND AreaTime 0700

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DAW33-85-D-0011 Contractor ATLANTIC TESTING LABConducted By FISHER All personnel present (Contr) 5
(Sub) _____
(Govt) _____

Subjects discussed (Note, delete, or add):

EM 385-1-1, Section: _____

Accident Prevention Plan

Individual Protective Equipment - LEATHER GLOVE WHEN WORKING WITH CABLEPrevention of Falls - WORKING OFF EQUIPMENTBack Injury, Safe Lifting Techniques - WHEN MOVING ROCK & TIMBERFire Prevention - CUTION WITH GASOLINE

Sanitation, First Aid, Waste Disposal -

Tripping Hazards - trash, hose, nails in lumber; LUMBER, ROCKS

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Inspection & Maintenance (Zero Defects) - DRILLERS RESPONSIBLE FOR RIGHoisting Equipment - 2 DRILL RIG + WRECKER DURING SITE MOVESRopes, Hooks, Chains and Slings - CAT HEAD ROPE

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

Loose Rock and Steep Slopes - 2.5 TO 1 SLOPE OF DAM FACE

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other - ATTENDANCE: P. FISHER, M. HAWKINS, T. BURNHAM, R. TODD, J. SAARINENPrepared by FISHER Title ENG

2. Forwarded.

EXPOSURE TIME FOR 2/29 - 2/28/86

ATL 238.5 HRS

CORRS 7 1/2

NED FL 251 SUB 8

Signature

Resident Engineer

NO WEEKEND WORKS

WEEKLY SAFETY MEETING

NEDSO

Date held 3/11/86

THRU: Area Engineer, NEW ENGLAND Area

Time 0700

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DAW 33-85-D-0011 Contractor ATLANTIC TESTING LAB

Conducted By P. FISHER All personnel present (Contr) 4

(Sub) _____
(Govt) _____

Subjects discussed (Note, delete, or add):

EM 385-1-1, Section: _____

Accident Prevention Plan

✓ Individual Protective Equipment -

✓ Prevention of Falls - ROCK SLOPE

✓ Back Injury, Safe Lifting Techniques -

✓ Fire Prevention - GASOLINE

Sanitation, First Aid, Waste Disposal -

✓ Tripping Hazards - trash, hose, nails in lumber -

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

✓ Equipment Inspection & Maintenance (Zero Defects) - CK BY DRILLER

✓ Hoisting Equipment - DRILL RIG, WRECKER

✓ Ropes, Hooks, Chains and Slings - CABLES

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

✓ Loose Rock and Steep Slopes - DAM SLOPE

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

Prepared by FISHER Title ENG.

2. Forwarded.

EXPOSURE TIME FROM 3/3 TO 3/11/86

ATL 193 1/2 HRS

CORPS 3 1/2

NED FL 251 SUB 7 1/2

Signature

[Signature]
Resident Engineer

NO WEEKEND WORK

WEEKLY SAFETY MEETING

NEDSO

Date held 3/18/86THRU: Area Engineer, NEW ENGLAND AreaTime 0700

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DAW33-85-D-0011 ^{D.O. #010} Contractor ATLANTIC TESTING LABConducted By PAUL FISHER All personnel present (Contr) 3
(Sub) _____
(Govt) _____

Subjects discussed (Note, delete, or add):

EM 385-1-1, Section: _____

Accident Prevention Plan

✓ Individual Protective Equipment -

Prevention of Falls -

Back Injury, Safe Lifting Techniques - INJURY LAST WEEK

Fire Prevention -

Sanitation, First Aid, Waste Disposal -(✓) Tripping Hazards - trash, hose, nails in lumber - IN WORK AREA

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Inspection & Maintenance (Zero Defects) - ✓ EQUIPMENTHoisting Equipment - DRILL RIG + WALKERRopes, Hooks, Chains and Slings - STAY CLEAR OF CABLE WHEN HOISTING

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

★ Loose Rock and Steep Slopes - ALL WORK ON 2.5 TO 1 ROCK SLOPE

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other - EXPOSURE TIME FOR 3/10 TO 3/4

ATL 171

Prepared by FISHER Title ENG

2. Forwarded. SUB 3 1/2

CP: CORPS 2 1/2

Signature [Signature]
Resident Engineer

NO WEEK END WORK

NOT ON SITE THIS WEEK, REPORT OF LAST WEEKS
EXPOSURE TIME

WEEKLY SAFETY MEETING

NEDSO

Date held 3-24-86

THRU: Area Engineer, NEW ENGLAND Area

Time _____

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DALW-33-85-D-0011 Contractor ATLANTIC TESTING LAB

Conducted By _____ All personnel present (Contr) _____

(Sub) _____

Subjects discussed (Note, delete, or add): (Govt) _____

EM 385-1-1, Section: _____

Accident Prevention Plan

Individual Protective Equipment -

Prevention of Falls -

Back Injury, Safe Lifting Techniques -

Fire Prevention -

Sanitation, First Aid, Waste Disposal -

Tripping Hazards - trash, hose, nails in lumber -

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Inspection & Maintenance (Zero Defects) -

Hoisting Equipment -

Ropes, Hooks, Chains and Slings -

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

Loose Rock and Steep Slopes -

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other - EXPOSURE TIME 3/17-3/21

Prepared by FISHER Title ENG

2. Forwarded. ATL 134 HRS

CF: CORPS 0

Signature [Signature]
Resident Engineer

SUB 2 1/2

NED FL
APP F2 251

NO WEEK END WORK

WEEKLY SAFETY MEETING

NEDSO

Date held 4-4-86THRU: Area Engineer, NEW ENGLAND AreaTime 1230

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. D.O. 010 Contractor ATLANTIC TESTING LAB
DAWN 33-85-D-0011Conducted By PAUL FISHER All personnel present (Contr) 2
(Sub) —
(Govt) —

Subjects discussed (Note, delete, or add):

EM 385-1-1, Section: PAUL FISHER
JERRY FAIRLEY☒ Accident Prevention Plan☒ Individual Protective Equipment - BOOTS☒ Prevention of Falls - 2.5:1 RIP RAP SLOPE☒ Back Injury, Safe Lifting Techniques - CARRYING EQUIPMENT UP & DOWN SLOPE

Fire Prevention -

Sanitation, First Aid, Waste Disposal -

☒ Tripping Hazards - trash, hose, nails in lumber -

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Inspection & Maintenance (Zero Defects) -

Hoisting Equipment -

Ropes, Hooks, Chains and Slings -

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

Welding, Cutting -

Excavations -

☒ Loose Rock and Steep Slopes -

Explosives -

Water Safety -

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other - JERRY NEW TO SITE FOR DYE TESTPrepared by FISHER Title ENGL

2. Forwarded.

CF:

Signature [Signature]
Resident Engineer



atl

ATLANTIC TESTING LABORATORIES, Limited

DAILY PROGRESS REPORT

Date 7-10-86 Report No. CD-011

Project HOP BROOK DAM DYE TEST Representative PAUL FISHER

EXPOSURE TIME

P.O. # 010

WEEK 4/2/86 TO 4/4/86, ATL 33.5 HRS

WEEKEND 4/5/86 TO 4/6/86, ATL 20.5 HRS

WEEK 4/7/86 TO 4/9/86, ATL 34.0 HRS

Time Arrived Jobsite _____

Time Departed Jobsite _____

SECTION 8
BORING LOGS

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOP BROOK DAM PROJECT NO. DACW33-BS-D-0011 D.O. # 10
Page 1 of 70 Pages
Hole No. FD-86-1 Diam. (Casing) 4" Boring Started 2-19-86
Co-ordinates: ^{STA} 4+58.4' ^{OFF} 11.6' Boring Completed 2-26-86
Drilled by HAWKINS + BURNHAM Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 380.6 ± M.S.L.
Total Overburden Drilled 87.0 Feet
Elevation Top of ~~Rock~~ CONCRETE M.S.L.
Elevation Bottom of Hole 293.6 M.S.L.
Total Rock Drilled 0 Feet
Total Depth of Hole 87.0 Feet
Core Recovered _____ %
Core Recovered _____ Ft.; _____ Diam. _____ In.
Soil Samples 2 3/8 In. Diam. _____ No.
Soil Samples _____ In. Diam. _____ No.

Casing Left in Place TOTAL 10 Feet
20' STICK UP

Water Table Depth _____

Depth		Method of Drilling and Type of Bit Used
From	To	
0	2.5	MOVED BOULDER RIP RAP BY HAND
2.5	50	2 3/8" SPLIT SPOON SAMPLER FOLLOWED BY 4 1/2" ID HOLLOW STEM AUGER
50	87	2 3/8" ID SPLIT SPOON SAMPLER FOLLOWED BY 4" DRIVE CASING AND 3 7/8" ROLLER BIT WASHED WITH WATER

INDEX

Ground Water _____ ~~Section of~~ Page 9
Boring Location Sketch _____ ~~Section of~~ Page 9
Overburden Record _____ Page 2-7
Rock Drilling _____ Page —
WELL INFO _____ Page 8, 10
_____ Page _____
_____ Page _____

Prepared by PAUL FISHER
Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Site HOP BROOK DAM, CT Page 2 of 10 Pages

Boring No. FD-86-1 Desig. FD-C Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: STA 4+58.4' OFF 11.6'

Elevation Top of Boring 380.6 M.S.L. Hammer Wt. 300 Boring Started 2-19-86
Total Overburden Drilled 87.0 Feet Hammer Drop 1.5
Elevation Top of ~~Rock~~ ^{CONCRETE} 293.6 M.S.L. Casing Left 3' Boring Completed 2-26-86
Total Rock Drilled 0 Feet | Subsurface Water Date: _____ | Page _____
Elevation Bottom of Boring 293.6 M.S.L. Obs. Well 3/4"
Total Depth of Boring 87.0 Feet Drilled By HANKINS & BURNHAM
Core Recovered — % No. Boxes — Mfg. Des. Drill TRULK MOUNT CME 75
Core Recovered — Ft. : — Diam. — In. Inspected By: FISHER
Soil Samples 23/8 In. Diam. — No. Classification By: FISHER
Soil Samples — In. Diam. — No. Classification By: —

DEPTH	CORE/SAMPLE			BLOWS PER FT. GORE REGRY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	PERCENT RECOVERED			
2.5					REMOVE BOULDERS BY HAND	BOULDERS (RIP RAP)
4.0					3" ODX 2' LONG SPLIT SPoon SAMPLER FOLLOWED BY 4 1/4 ID AUGER	BR, MOIST - cmf SAND, SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-GM)
6.0	S-1	2 3/8	100%	6 16 22 30		
8.0	S-2	"	100%	30 31 22 31		
10.0	S-3	"	75%	11 21 24 40		

GENERAL REMARKS:

N.S. - no sample recovered generally
due to cobbles.

DEPTH		CORE/SAMPLE			BLOWS PER FT. CORRE RECHY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO. 2 10.0	NO.	SIZE	REF. CORRE			
	11.3	S-4	2 3/8	100%	45 55 100 3'	3" ODX 2' LONG SPLIT SPOON SAMPLER FOLLOWED BY 4 1/4" ID AUGER	BR, MOIST, -cmf SAND, SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-GM)
	14.0	"	"	"	NS		
	16.0	S-5	"	100%	25 73 42 60		
	18.0	S-6	"	100%	32 54 40 56		
	18.4	S-7	"	100%	100 1/4'		
	20.0						
	21.0	S-8	"	100%	32 60		
	22.0						
	24.0	S-9	"	100%	22 43 33 31		
	26.0	S-10	"	100%	18 13 34 46		
/	/	/	/	/	/	/	/

Site

Boring No.

Page 4

Hop Brook Dam, CT

FD-86-1

of 10

DEPTH	CORE/SAMPLE			BLOWS PER FT CORE RECY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO	SIZE	RECY			
26.0						
27.3	S-11	2 3/8	100%	36 40 60/3'	3" OD x 2' LONG SPLIT SPOON SAMPLER FOLLOWED BY 4 1/4" ID AUGER	BR, MOIST, -cmf SAND, SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-GM)
28.0						
	S-12	"	100%	24 30 32 54		
30.0						
	S-13	"	100%	20 27 35 39		
32.0						
	S-14	"	100%	24 29 36 40		
34.0						
	S-15	"	100%	11 40 100/4'		
35.4						
				NS		
38.0						
	S-16	"	100%	23 75		
39.0						
40.0						
	S-17	"	100%	37 60/4'		
40.9						
42.0						
	S-18	"	100%	44 60		
43.0						

Site

HOP BROOK DAM, CT

Boring No.

FD-86-1

Page 5

of 10

DEPTH	CORE/SAMPLE		BLOW PER FT CORE REMARKS	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
43.0					
44.0					
	S-19	2 3/8	100%	33	BR, MOIST, -cmf SAND SOME GRAVEL, LITTLE COBBLE, TRACE SILT. (SP-6M)
				54	
45.5				65	
46.0					
	S-20	"	100%	34	
47.0				60	
48.0					
	S-21	"	100%	55	
48.9				60/4'	
50.0					
	S-22	"	100%	43	Brown cuttings and wash water
				49	
51.5				60	
				NS	
54.0					
54.3	S-23	"	50%	100/3'	
56.0					
	S-24	"	75%	38	
56.6				60/1'	
58.0					
58.3	—	"	0	100/13	
60.0					

Site

Hop Brook Dam, CT

Boring No.

FD-86-1

Page 6

of 10

DEPTH	CORE/SAMPLE				BLOWS PER FT. CORE RECOVERY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	PERCENT	PERCENT			
1.2 60.0							
60.8	S-25	2 3/8	30%	30	60/3'	3" OD X 2' LONG SPLIT SPOON SAMPLER FOLLOWED BY 4" DRIVE CASING AND 3 7/8" ROLLER BIT WITH WATER	BR, MOIST, -cmf SAND, SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-6M)
62.0							
63.4	S-26	"	65%	45 55 60/4			Brown cuttings and wash water.
66.0					NS		
68.0	S-27	"	50%	38 50 40 38			
70.0	S-28	"	30%	14 21 19 25			
70.3	-	-	0	100/3'			
72.0							
73.5	S-29	"	80%	33 29 60			
76.0					NS		
/	/	/	/	/	/	/	/

A simple line drawing of a door frame with a handle. The drawing is minimalist, using black lines on a white background. It shows a vertical door frame with a horizontal handle on the right side. The lines are slightly irregular, giving it a hand-drawn appearance.

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 2-26-86

LOCATION (STA): 4+58.4 OFFSET FROM CENTER LINE: 11.6 PIEZ NO.: FD-86-1

PIEZ TYPE: 2' Porous Plastic DEPTH OF PIEZ: 82.9 RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): (SP-GM) SOIL SAMPLE NO.: S-30 BORING DIAM: 4"

METHOD OF INSTALLATION: DRIVE CASING + ROLLER WASH WITH WATER

TYPE OF PROTECTION FOR PIEZ: 3" ϕ X 10' LONG PIPE VENT: 1/8" HOLE IN PIPE CAP

GROUND ELEV.: 380.6 \pm ELEV. TOP OF RISER: 382.57 ELEV PIEZ TIP: 297.7'

FILTER: #2 SAND FROM ELEV: 295.6' TO ELEV: 311.6'

SEAL: 3/8 PELTONITE FROM ELEV: 293.6' TO ELEV: 295.6'

INSTALLED BY: HAWKINS + BURHAM CONTRACT D-12 #10 NO.: DALW33-85-D-001 FOREMAN: P. FISHER

DATE OF INSTALLATION: 2-26-86 DATE OF OBSERVATIONS: 3-3-86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1540	—	67.76	BEFORE ADDING WATER					
1550	0	45						
1555	5	66.05						
1600	10	66.52						
1620	30	67.22						

REMARKS: COULD NOT FILL RISER TOTALLY WITH WATER.

STARTED TEST AFTER ADDING 20 GAL OF WATER.

2.0' STILL RUD

84.9' TOTAL LENGTH

PAUL FISHER
INSPECTOR

Site: Hop Brook Dam
 Boring No: FD-86-1

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
2/20	0700	50'	50	DRY	—	From Ground Surface
2/21	0730	50'	50'	DRY	—	" " "
2/24	1330	60'	60'	28'	—	" " "
2/25	0700	74'	74'	67'	—	" " "
2/26	0730	85'	87'	67'	—	" " "
2/26	1300	8'	87'	64.03	—	From Surface Casin
2/27	1500	8'	87'	68.02	—	" " "
3/3	1540	8	87	67.76	—	" " "

Note: Depths are in feet below original ground

BORING LOCATION SKETCH

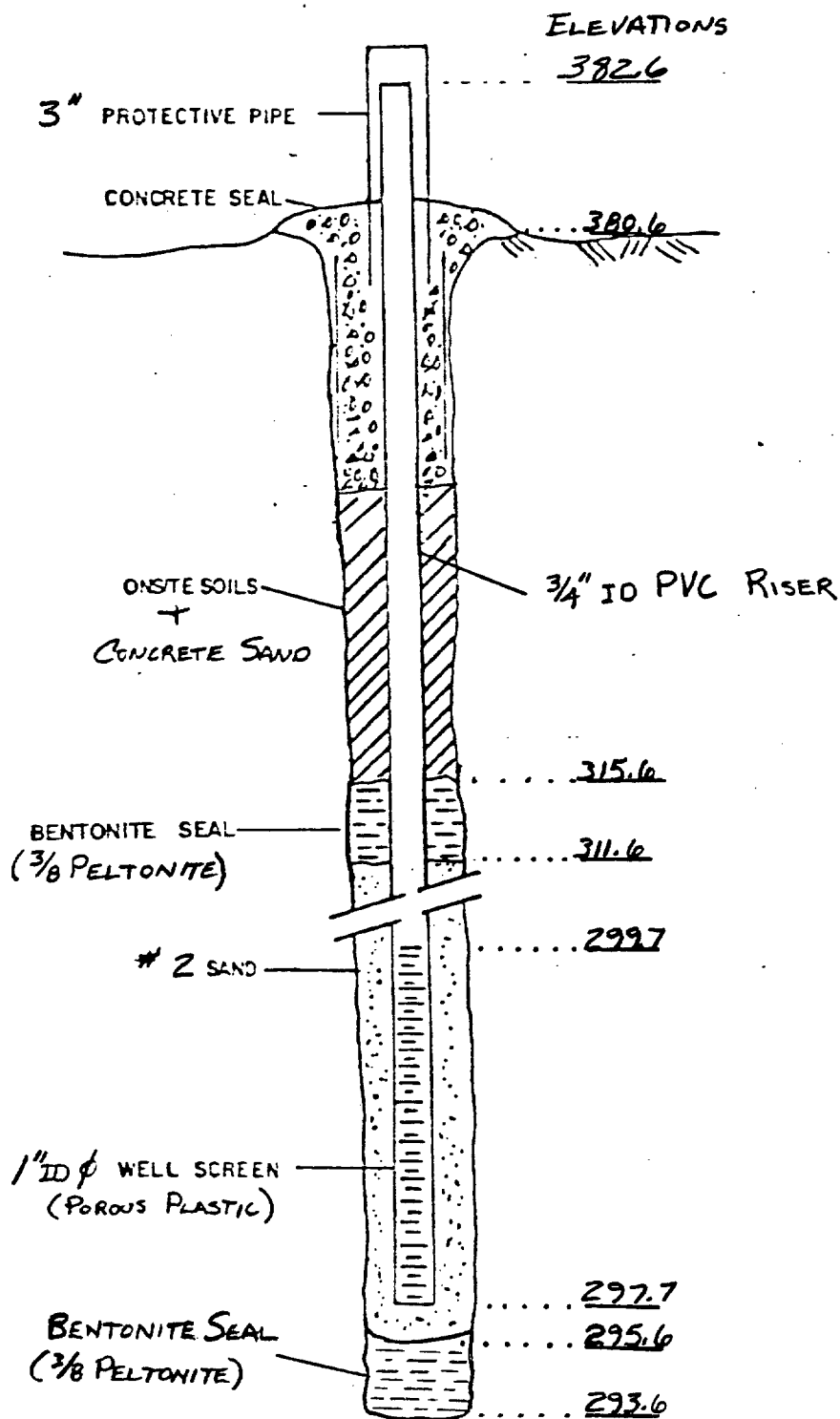
SEE DRAWING

MONITOR WELL
INSTALLATION DETAIL

PAGE 1/00F 1/0

CLIENT CORPS OF ENGINEERS
PROJECT NEW ENGLAND DIVISION
HOP BROOK DAM, CT
DRAW-33-65-D-0011, D.O.#010

REPORT NO. CD 011
WELL NO. FD-86-1



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site Hop Brook Dam PROJECT NO. DAEN 33-85-D-0011 D.O. # 10
Page 1 of 7 Pages
Hole No. FO-86-2 Diam. (Casing) 4" Boring Started 2-25-86
Co-ordinates: STA 477.1 OFF 179.4 Boring Completed 2-27-86
Drilled by TODD + SAARINEN Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 313.6 ± M.S.L.
Total Overburden Drilled 32 Feet
Elevation Top of Rock — M.S.L.
Elevation Bottom of Hole 281.6 M.S.L.
Total Rock Drilled 0 Feet
Total Depth of Hole 32 Feet
Core Recovered — %
Core Recovered — Ft.; — Diam. — In.
Soil Samples 2 3/8 In. Diam. — No.
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 10 Feet
3.0 STICKUP

Water Table Depth —

Depth		Method of Drilling and Type of Bit Used
From	To	
0	2	MOVED BOULDERS
2	6	6" CORE
6	27	4" DRIVE CASING + 3 3/8" ROLLER
—	—	WASH WITH WATER
27	32	2.2" ID CORE WITH WATER

INDEX

Ground Water _____ Back of Page 6
Boring Location Sketch _____ Back of Page 6
Overburden Record _____ Page 2,3,4
Rock Drilling _____ Page _____
WELL INFO. _____ Page 5,7
_____ Page _____
_____ Page _____

Prepared by PAUL FISHER

Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Site HOP BROOK DAM Page 2 of 7 Pages

Boring No. FD-86-2 Desig. FD-A Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: STA 4+77.1' 20FF 179.4'

Elevation Top of Boring 313.6 M.S.L. Hammer Wt. 300 Boring Started 2-25-86
Total Overburden Drilled 32 Feet Hammer Drop 1.5'
Elevation Top of Rock — M.S.L. Casing Left 3" Boring Completed 2-27-86
Total Rock Drilled 0 Feet | Subsurface Water Date: — | Page: —
Elevation Bottom of Boring 281.6 M.S.L. Obs. Well 3/4"
Total Depth of Boring 32 Feet Drilled By TODD + SAARINEN
Core Recovered 16 % No. Boxes JAR S-4 Mfg. Des. Drill CME 45
Core Recovered — Ft : — Diam. — In. Inspected By: FISHER
Soil Samples 2 3/8 In. Diam. — No. Classification By: FISHER
Soil Samples — In. Diam. — No. Classification By: —

DEPTH	CORE/SAMPLE		BLOWS PER FT. CORE RECOVERY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
				MOVED BOULDERS BY HAND	BOULDERS (RIP RAP)
				6" ϕ CORE WITH WATER	
6.0					
	S-1	2 3/8	60%	7 13 21 26	BR. MOIST, -cmf SAND SOME GRAVEL, LITTLE COBBLES, TRACE SILT (SP-GM)
8.0					
				NS	Brown cuttings and wash water.
10.0					

GENERAL REMARKS:

N.S. - no sample recovered generally
due to cobbles.

FBA (Test)

Site

HOP BROOK DAM, CT

Boring No.

FD-86-2

Page

4

of

7

DEPTH		CORE/SAMPLE			BLOW PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	P. Z	NO.	SIZE	DEPTH RANGE			
	27.0						
		S4	2.2		16%	2.2" ID CORE BARREL USING WATER	ASSUMED SANDY GRAVEL AND COBBLE, MANY VOIDS
	32.0					BORING TERMINATION	

58A(Test)

Boring No.

FD-86-2

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 2-27-86

LOCATION (STA): 4+77.1 OFFSET FROM CENTER LINE: 179.4' PIEZ NO.: FD-86-2

PIEZ TYPE: 1" X 2' POROUS PLASTIC DEPTH OF PIEZ: 31.1' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): ASSUMED (GP-SP) W/LOGS SAMPLE NO.: — BORING DIAM: 4"

METHOD OF INSTALLATION: DRIVE CASING & ROLLER WASH

TYPE OF PROTECTION FOR PIEZ: 3" ϕ X 10' LONG PIPE VENT: 1/8" HOLE IN PIPE CAP

GROUND ELEV.: 313.6 ± ELEV. TOP OF RISER: 317.99' ELEV PIEZ TIP: 283.9'

FILTER: #2 SAND FROM ELEV: 281.6' TO ELEV: 303.6'

SEAL: 3/8 PELTONITE FROM ELEV: 303.6' TO ELEV: 307.6'

INSTALLED BY: TODD & SAARINEN CONTRACT D.U.# 00 NO.: DACW37-85-D 001 FOREMAN: FISHER

DATE OF INSTALLATION: 2-27-86 DATE OF OBSERVATIONS: 3-3-86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1626	BEFORE TEST	32.44	1713	30	32.37			
1643	0	30.25						
1649	1	30.85						
1648	5	31.65						
1653	10	32.03						

REMARKS: COULD NOT FILL RISER TOTALLY WITH WATER.

STARTED TEST AFTER ADDING 20 GAL OF WATER.

4.4' SUCKUP

34.1' TOTAL LENGTH

PAUL FISHER
INSPECTOR

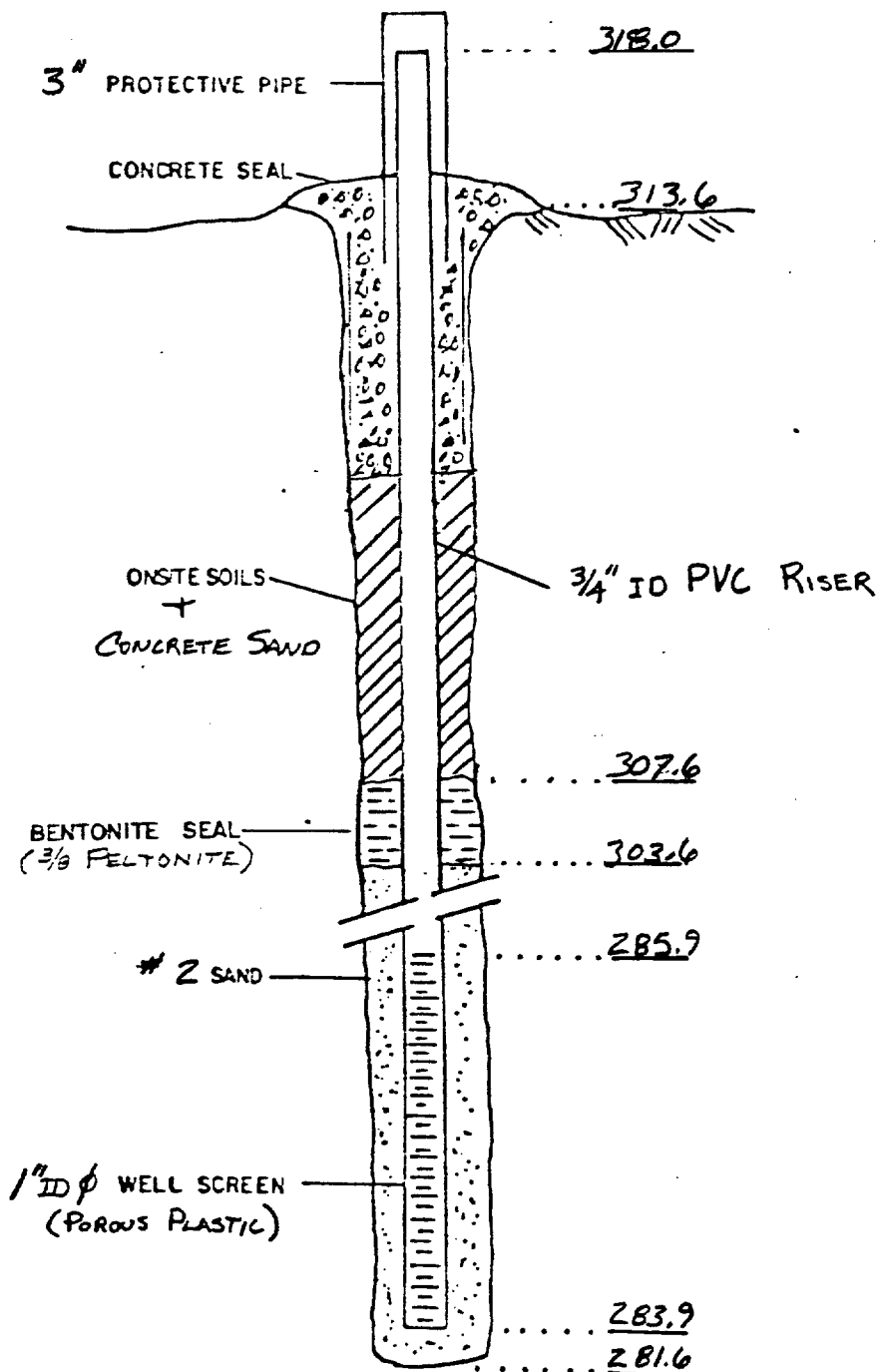
MONITOR WELL INSTALLATION DETAIL

PAGE 7 OF 7

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
 PROJECT HOP BROOK DAM, CT
DAW-33-85-D-0011, D.O.#010

REPORT NO. CD 011
 WELL NO. FD-86-Z

ELEVATIONS



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOP BROOK DAM PROJECT NO. DACW 33-85-D-0011 P.O. # 10
Page 1 of 11 Pages
Hole No. FD-B6-3 Diam. (Casing) 4 Boring Started 2-27-86
Co-ordinates: ^{STA} 3+57.8 ^{OFF} 12.7 Boring Completed 3-6-86
Drilled by HAWKINS & BURNHAM Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 380.6 ± M.S.L.
Total Overburden Drilled 102.5 Feet
Elevation Top of Rock 278.1 M.S.L.
Elevation Bottom of Hole 275.1 M.S.L.
Total Rock Drilled 3 Feet
Total Depth of Hole 105.5 Feet
Core Recovered 0, ROLLER BIT %
Core Recovered _____ Ft.; _____ Diam. _____ In.
Soil Samples 2 3/8 In. Diam. 3 No.
Soil Samples _____ In. Diam. _____ No.

Casing Left in Place TOTAL 10 Feet
2.6' STICKUP

Water Table Depth _____

Depth		Method of Drilling and Type of Bit Used
From	To	
0	45	4" ID AUGER
45	105.5	4" ROLLER BIT USING CLEAR MUD

INDEX	
Ground Water _____	Back of Page <u>10</u>
Boring Location Sketch _____	Back of Page <u>10</u>
Overburden Record _____	Page <u>2-8</u>
Rock Drilling _____	Page <u>8</u>
<u>WELL INFO</u> _____	Page <u>9, 11</u>
_____	Page _____
_____	Page _____

Prepared by PAUL FISHER
Field Data
Submitted by ATLANTIC TESTING LAB

Lab. Data _____

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Site HOP BROOK DAM Page 2 of 11 Pages

Boring No. FD-86-3 Desig. FD-D Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: STA 3+57.8 OFF 12.7'

Elevation Top of Boring 380.6 ± M.S.L. Hammer Wt. 300 Boring Started 2-27-86
Total Overburden Drilled 102.5 Feet Hammer Drop 18"
Elevation Top of Rock 278.1 M.S.L. Casing Left 3" Boring Completed 3-6-86
Total Rock Drilled 3 Feet Subsurface Water Date — Page —
Elevation Bottom of Boring 275.1 M.S.L. Obs. Well 3/4"
Total Depth of Boring 105.5 Feet Drilled By HAWKINS + BURNHAM
Core Recovered 0 % No. Boxes — Mfg. Des. Drill TRUCK MOUNT CME 75
Core Recovered — Ft : — Diam. — In. Inspected By: FISHER
Soil Samples 2 3/8 In. Diam. 3 No. Classification By: FISHER
Soil Samples — In. Diam. — No. Classification By: —

DEPTH 1"	CORE/SAMPLE			BLOWS PER FT. CORE REC'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	REC.			
20				NR	MOVED BOULDERS BY HAND	BOULDERS (RIP RAP)
100				NR	4 1/4" ID AUGER	ASSUMED GRAVELLY SAND (SP-6M)

GENERAL REMARKS:

NR - Sampling not required.
NS - No sample recovered generally
due to cobbles.

Site

Hop Brook Dam, CT

Boring No.

FD-86-3

Page 3

of 11

DEPTH		CORE/SAMPLE		BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1.2 100	NO	SIZE				
15			NR		4 1/4 ID AUGER	ASSUMED GRAVELLY SAND (SP-GM)
20						
27.0						

HOP BROOK DAM, CT

FD-86-3

DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	N. 2	NO.	SIZE	CORE REC'D		
270				NR	4 1/4 ID AUGER	ASSUMED GRAVELLY SAND (SP-GM)
30						
40						
490						

Site

Hop Brook Dam, CT

Boring No.

FD-86-3

Page

5

of

11

DEPTH	CORE/SAMPLE		BLOW PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO	SIZE			
1.2 44.0					
45.0			NR	4 1/4" ID AUGER	ASSUMED GRAVELLY SAND (SP-GM)
			NR	4" ROLLER BIT USING CLEAR MUD RECIRCULATED	Brown cuttings and wash water
50					
60.0					
61.0					

Site

Boring No.

Page 6of 11

HOB BROOK DAM, CT

FD-86-3

DEPTH		CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
NO.	SIZE	DEPTH RANGE	CORE RECVY			
1:2 61.0			NR		4" ROLLER BIT USING CLEAR MUD	ASSUMED GRAVELLY SAND (SP-6M) Brown cuttings and wash water
70						
78.0						

Site

HOP BROOK DAM, CT

Boring No.

FD-86-3

Page 7

of 11

DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1. 2	NO.	SIZE	RECORDED		
	78.0					
	80		NR		4" ROLLER BIT USING CLEAR MUD	ASSUMED GRAVELLY SAND (SP-GM) Brown cuttings and wash water
	90					
	92.0					
	94.0	5-1	2 3/8	20%	48 42 53 78 3" ϕ x 2' SPLIT SPOON, 4" ROLLER WITH CLEAR MUD	BR MOIST, -cmf SAND SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-GM)
	95.0		NS			

Site

HOPBROOK DAM, CT

Boring No.

FD-86-3

Page 8

of 11

DEPTH	CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS		CLASSIFICATION OF MATERIALS
	NO	SIZE				
1.2 95.0						
96.0			NS			BR Moist, -cmf SAND SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SP-GM) Brown cuttings and wash water.
97.0	S-2	2 3/8	40%	45 60		
			NS			
100.0						
100.5	S-3	"	50%	100/5		BEDROCK Brown cuttings and wash water.
			NS			
102.5						
			NR			
105.5						BORING TERMINATION

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM | DATE: 3 - 6 - 86
 LOCATION (STA): 3 + 57.8 OFFSET FROM CENTER LINE: 12.7' PIEZ NO.: FO-86-3
 PIEZ TYPE: 1" x 2' Porous Plastic DEPTH OF PIEZ: 100.3 RISER PIPE DIAM: 3/4"
 PIEZ TIP SET IN (SOIL TYPE): (SP-GM) SOIL SAMPLE NO.: S-3 BORING DIAM: 4"

METHOD OF INSTALLATION: 4" ϕ ROLLER WASH WITH CLEAR MUD
 TYPE OF PROTECTION FOR PIEZ: 3" ϕ x 10 LONG PIPE VENT: 1/8" HOLE IN PIPE CAP

GROUND ELEV.: 380.6 \pm ELEV. TOP OF RISER: 383.24 ELEV PIEZ TIP: 280.3'

FILTER: #2 SAND FROM ELEV: 275.1' TO ELEV: 293.1'

SEAL: 3/8 PELTONITE FROM ELEV: 293.1' TO ELEV: 297.1'

INSTALLED BY: HAWKINS + BURNHAM CONTRACT NO.: O.O. 4010 FOREMAN: FISHER
 NO.: DACN33-86-D004

DATE OF INSTALLATION: 3 - 6 - 86 DATE OF OBSERVATIONS: 3 - 10 - 86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1623	—	76.31	1704	30	75.61			
1634	0	≈ 0 *						
1635	1	≈ 30.0 *						
1639	5	65.0						
1644	10	72.86						

REMARKS: *WATER DROPPING TO FAST FOR ACCURATE MEASUREMENT

2.6' STICK UP

102.9' TOTAL LENGTH

PAUL FISHER
INSPECTOR

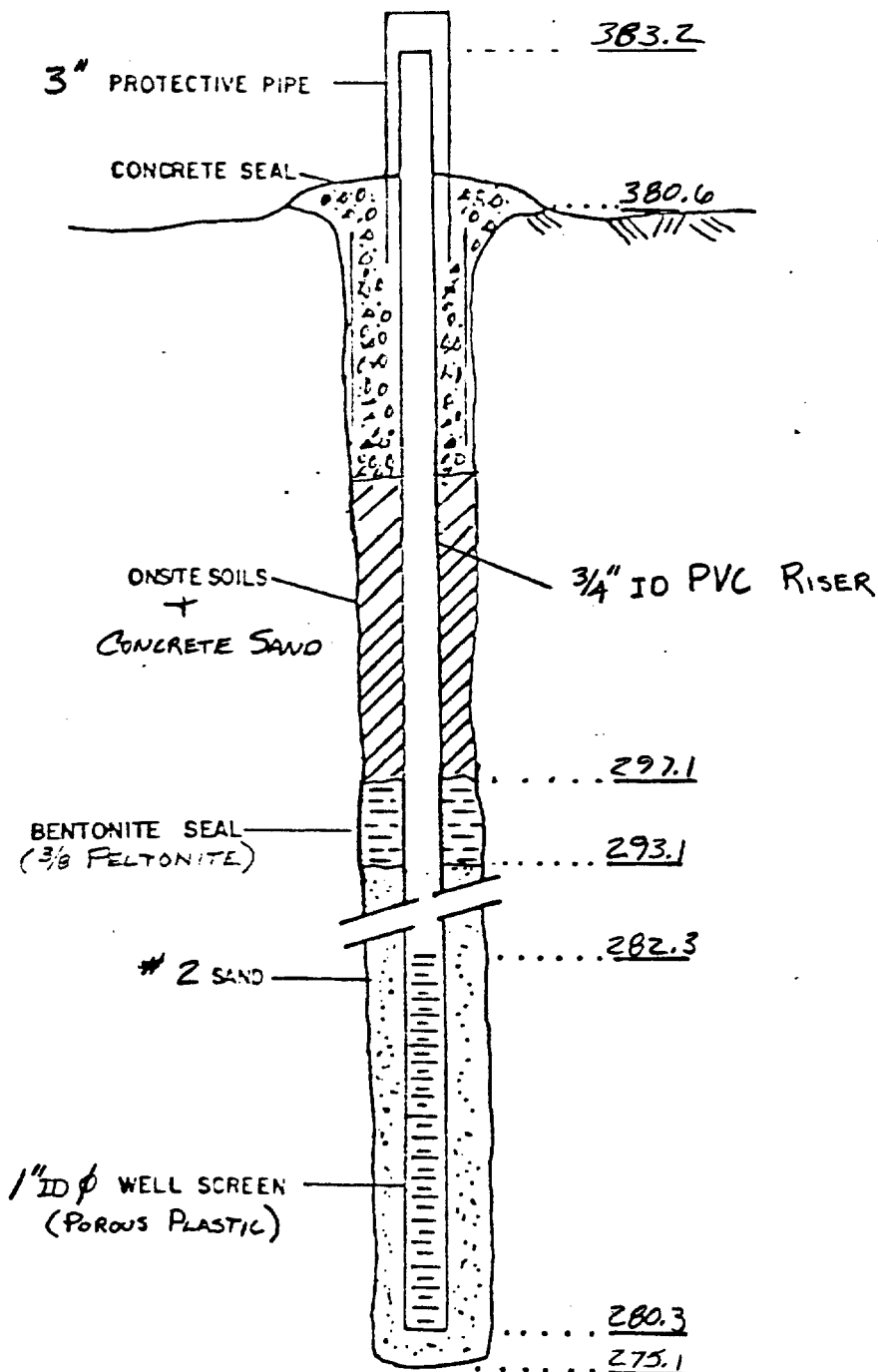
MONITOR WELL
INSTALLATION DETAIL

PAGE 11 OF 17

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
PROJECT HOP BROOK DAM, CT
DAW-33-85-D-0211, D.O.#010

REPORT NO. CD 011
WELL NO. FD-86-3

ELEVATIONS



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOP BROOK DAM PROJECT NO. DALW 33-85-D-0011 R.O.# 10
Page 1 of 7 Pages
Hole No. FD-86-4 Diam. (Casing) 4" Boring Started 2-28-86
Co-ordinates: ^{STA} 4+58.4 ^{OFF} 240.8' Boring Completed 3-4-86
Drilled by TODO & SAARINEN Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 286.2 ± M.S.L. Casing Left in Place TOTAL 10 Feet
Total Overburden Drilled 13 ± Feet
Elevation Top of Rock 273.2 M.S.L. 3.1' STICKUP
Elevation Bottom of Hole 269.2 M.S.L.
Total Rock Drilled 4.0 Feet
Total Depth of Hole 17.0 Feet
Core Recovered 69% % ← NOTE: SOME OF THIS CORE WAS BOULDERS
Core Recovered 4.8 Ft.; 2" Diam. — In. AND NOT ALL BEDROCK
Soil Samples 2 3/4 In. Diam. 0 No.
Soil Samples _____ In. Diam. _____ No. Water Table Depth _____

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	9	6" CORE WITH WATER	Ground Water	Back of Page <u>6</u>
9	10	3 7/8" ROLLER WITH WATER	Boring Location Sketch	Back of Page <u>6</u>
10	15	NX CORE WITH WATER	Overburden Record	Page <u>2,3</u>
10	13	3 7/8" ROLLER WITH WATER, 4" CASING	Rock Drilling	Page <u>4</u>
15	17	NX CORE WITH WATER	<u>WELL INFO.</u>	Page <u>5,7</u>
				Page _____
				Page _____

Prepared by PAUL FISHER
Field Data

Submitted by ATLANTIC TESTING LAB

Lab. Data

Site

Boring No.

Page 3

Hop Brook Dam, CT

FD-86-4

of 7

DEPTH		CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1.2 10.0	NO.	SIZE	DEPTH CORE RANGE		
	13.0	RUN 1	2"	56%	NX CORE WITH WATER	COBBLES WITH VERY LITTLE SOIL, UNABLE TO SAMPLE GNEISS
	15.0					
	17.0	RUN 2	2"	100%	BORING TERMINATION	GNEISS

FIELD LOG OF TEST BORING IN ROCK

SITE HOP BROOK DAM

ROLE NO. FD-86-4

PAGE 4 OF 7

DATE	DEPTH PT.		RUN PT.	REC' V' Y PT.	REC' V' Y %	DRILLING BEHAVIOR			ACTUAL DRILLING TIME	BIT NO. SIZE AND TYPE	ADDITIONAL REMARKS
	FROM	TO				FEED	WATER	REASON FOR POLL			
3/3	10	15	5.0	2.8	56%	MED.	LOST	TOTAL 5'	40 MIN	NY DIA.	? BED ROCK LOCATION
3/4	15	17	2.0	2.0	100%	MED	LOST	TERMINATED	20 MIN	NY DIA.	ASSUMED AT 13' DEPTH DUE TO BOULDERS

TOTAL BED ROCK DRILLED 4.0 FEET (SEE NOTE ABOVE)

TOTAL BED ROCK RECOVERED 4.0 FEET

BED ROCK RECOVERY 100% PERCENT

DRILLER TODD SAMRINEN

INSPECTOR FISHER

MED FORM 130
DEC 63

REPLACES EDITION OF APR 62 WHICH MAY BE USED UNTIL EXHAUSTED

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 3-5-86
 LOCATION (STA): 4+58.4 OFFSET FROM CENTER LINE: 240.8' PIEZ NO.: FD-86-4
 PIEZ TYPE: 1" x 2' PERVIOUS PLASTIC DEPTH OF PIEZ: 14.7' RISER PIPE DIAM: 3/4
 PIEZ TIP SET IN (SOIL TYPE): BED ROCK ~~SOIL~~ Rock SAMPLE NO.: RUN #2 BORING DIAM: 3" + 4"

METHOD OF INSTALLATION: 3 7/8 ROLLER + NX CORE WITH WATER
 TYPE OF PROTECTION FOR PIEZ: 3" ϕ x 10' LONG PIPE VENT: 1/8" HOLE IN PIPE CAP
 GROUND ELEV.: 286.2 \pm ELEV. TOP OF RISER: 289.27 ELEV PIEZ TIP: 271.5

FILTER: #2 SAND FROM ELEV: 269.2 TO ELEV: 279.2'

SEAL: NONE FROM ELEV: — TO ELEV: —

INSTALLED BY: TODD + SAARINEN CONTRACT D.O.#10 NO.: DALW 33-85-DW11 FOREMAN: FISHER

DATE OF INSTALLATION: 3-4-86 DATE OF OBSERVATIONS: 3-10-86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1514	BEFORE TEST	10.06	1608	30	10.06			
1538	0	0						
1539	1	10.01						
1543	5	10.03						
1548	10	10.05						

REMARKS: - 17.8 TOTAL DEPTH

- 3.1 STICK UP

PAUL FISHER
INSPECTOR

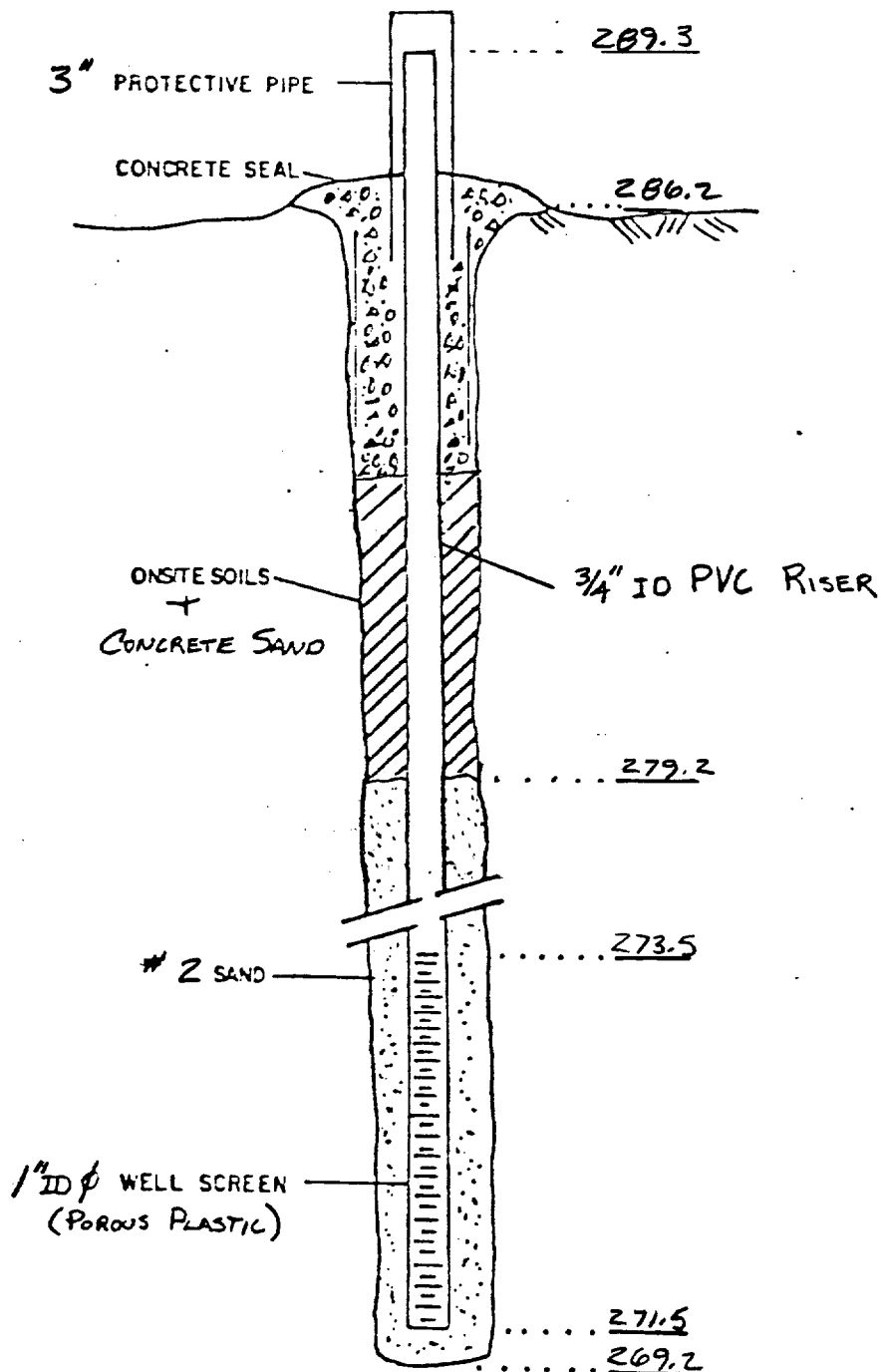
MONITOR WELL
INSTALLATION DETAIL

PAGE 7 OF 7

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
PROJECT HOP BROOK DAM, CT
DAW-33-85-D-0011, D.O.#010

REPORT NO. CD 011
WELL NO. FD-86-4

ELEVATIONS



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOD BROOK DAM PROJECT NO. DACW 33-85-D-0011 D.O.#10
Page 1 of 7 Pages
Hole No. ED-86-5 Diam. (Casing) 2" Boring Started 3-5-86
Co-ordinates: ^{STA} 5404.1 ^{OFFSET} 214.3 Boring Completed 3-6-86
Drilled by TOOD & SAARINEN Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 303.3 ± M.S.L.
Total Overburden Drilled 0 Feet
Elevation Top of Rock 303.3 M.S.L.
Elevation Bottom of Hole 283.3 M.S.L.
Total Rock Drilled 20.0 Feet
Total Depth of Hole 20.0 Feet
Core Recovered 98 %
Core Recovered 19.6 Ft.; 2" Diam. — In.
Soil Samples — In. Diam. — No.
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 10 Feet
3.1 STICKUP

Water Table Depth —

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	20	NX CORE WITH WATER	Ground Water	Back of Page <u>6</u>
			Boring Location Sketch	Back of Page <u>6</u>
			Overburden Record	Page <u>—</u>
			Rock Drilling	Page <u>234</u>
			<u>WELL INFO.</u>	Page <u>5, 7</u>
				Page <u>—</u>
				Page <u>—</u>

Prepared by PAUL FISHER Field Data
Submitted by ATLANTIC TESTING LAB Lab. Data

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Site Hop Brook Dam, CT Page 2 of 7 Pages

Boring No. FD-865 Desig. FD-B Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: STA 5+04.1 OFF 214.3'

Elevation Top of Boring 303.3 M.S.L. Hammer Wt. — Boring Started 3-5-86
Total Overburden Drilled 0 Feet Hammer Drop —
Elevation Top of Rock 303.3 M.S.L. Casing Left 2" Boring Completed 3-6-86
Total Rock Drilled 20 Feet Subsurface Water Date — Page —
Elevation Bottom of Boring 283.3 M.S.L. Obs. Well 3/4
Total Depth of Boring 20 Feet Drilled By TODD + SAARINEN
Core Recovered 98 % No. Boxes 2 Mfg. Des. Drill CME 45
Core Recovered 19.6 Ft : 2" Diam. — In. Inspected By: FISHER
Soil Samples — In. Diam. — No. Classification By: FISHER
Soil Samples — In. Diam. — No. Classification By: —

DEPTH	CORE/SAMPLE			BEAMS PERFECT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	DEPTH RANGE			
1.0					NX CORE WITH WATER	GNEISS Ramatized SHIST
5.0					NX CORE WITH WATER	GNEISS Ramatized SHIST
	Run 1	2"		100%	NX CORE WITH WATER	GNEISS Ramatized SHIST
7.0					NX CORE WITH WATER	GNEISS Ramatized SHIST
	Run 2	2"		80%	NX CORE WITH WATER	GNEISS Ramatized SHIST
8.0					NX CORE WITH WATER	GNEISS Ramatized SHIST
	Run 3	2"		100%	NX CORE WITH WATER	GNEISS Ramatized SHIST
	Run 4	2"		98%	NX CORE WITH WATER	GNEISS Ramatized SHIST
10.0					NX CORE WITH WATER	GNEISS Ramatized SHIST

GENERAL REMARKS:

Site

Boring No.

Page 3

Hop Brook Dam, CT

FD-86-5

of 7

DEPTH		CORE/SAMPLE				SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	P. Z	NO.	SIZE	DEPTH RANGE	CORE RECVY		
	10.0					NX CORE WITH	BEDROCK, SHIST
		RUN 4 CONT.	2"		98%		
	13.0						
		RUN 5	2"		100%		
	18.0					BORING TERMINATION	
		RUN 6	2"		100%		
	20.0					BORING TERMINATION	

FIELD LOG OF TEST BORING IN ROCK

SITE Hop Brook Dam

ROLE NO. FD-86-5

PAGE 4 OF 7

DATE	DEPTH PT.		RUN PT.	RUN REC' V' Y PT.	REC' V' Y %	DRILLING BEHAVIOR			ACTUAL DRILLING TIME	BIT NO. SIZE AND TYPE	ADDITIONAL REMARKS
	FROM	TO				PEED	WATER	REASON FOR PULL			
1 3/5/86	0.0	5.0	5.0	5.0	100%	MED.	SOME LOSS	5' RUN	35 MIN	NX DIA.	
2 3/5/86	5.0	7.0	2.0	1.7	80%	MED	TOTAL LOSS	BOUND UP	25 MIN	"	
3 3/5/86	7.0	8.0	1.0	1.0	100%	MED	INTERMITTENT LOSS	BOUND UP	15 MIN	"	
4 3/6/86	8.0	13.0	5.0	4.9	98%	MED	NO LOSS	5' RUN	45 MIN	"	
5 3/6/86	13.0	18.0	5.0	5.0	100%	MED	NO LOSS	5' RUN	40 MIN	"	
6 3/6/86	18.0	20.0	2.0	2.0	100%	MED	NO LOSS	FINISHED	18 MIN	"	

TOTAL BED ROCK DRILLED 20.0 FEET

TOTAL BED ROCK RECOVERED 19.6 FEET

BED ROCK RECOVERY 98 PERCENT

DRILLER TODD & SAARINEN

INSPECTOR FISHER

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 3-6-86

LOCATION (STA): 5+04.1 OFFSET FROM CENTER LINE: 214.3' PIEZ NO.: FO-86-5

PIEZ TYPE: 1" ϕ X 2' POROUS PLASTIC DEPTH OF PIEZ: 18.2' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): BED ROCK SOIL SAMPLE NO.: RUN #6 BORING DIAM: 3"

METHOD OF INSTALLATION: NX CORE

TYPE OF PROTECTION FOR PIEZ: 2" ϕ X 10' LONG PIPE VENT: 1/8" HOLE IN CAP

GROUND ELEV.: 303.3' ELEV. TOP OF RISER: 306.59' ELEV. PIEZ TIP: 285.3'

FILTER: #2 SAND FROM ELEV: 283.3' TO ELEV: 291.3'

SEAL: 3/8 PELTONITE FROM ELEV: 291.3 TO ELEV: 295.3

INSTALLED BY: TODD SAARINEN CONTRACT D.O.# 010 NO.: DACN33-85-D FOREMAN: FISHER
-0011

DATE OF INSTALLATION: 3-6-86 DATE OF OBSERVATIONS: 3-10-86

METHOD OF TESTING PIEZ.: FALL HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1514	BEFORE TEST	DRY 21.24	1549	30	16.81			
1519	0	0						
1520	1	9.45						
1524	5	12.17						
1529	10	14.48						

REMARKS: 21.3' TOTAL DEPTH

3.1 STICK UP

PAUL FISHER
INSPECTOR

MONITOR WELL
INSTALLATION DETAIL

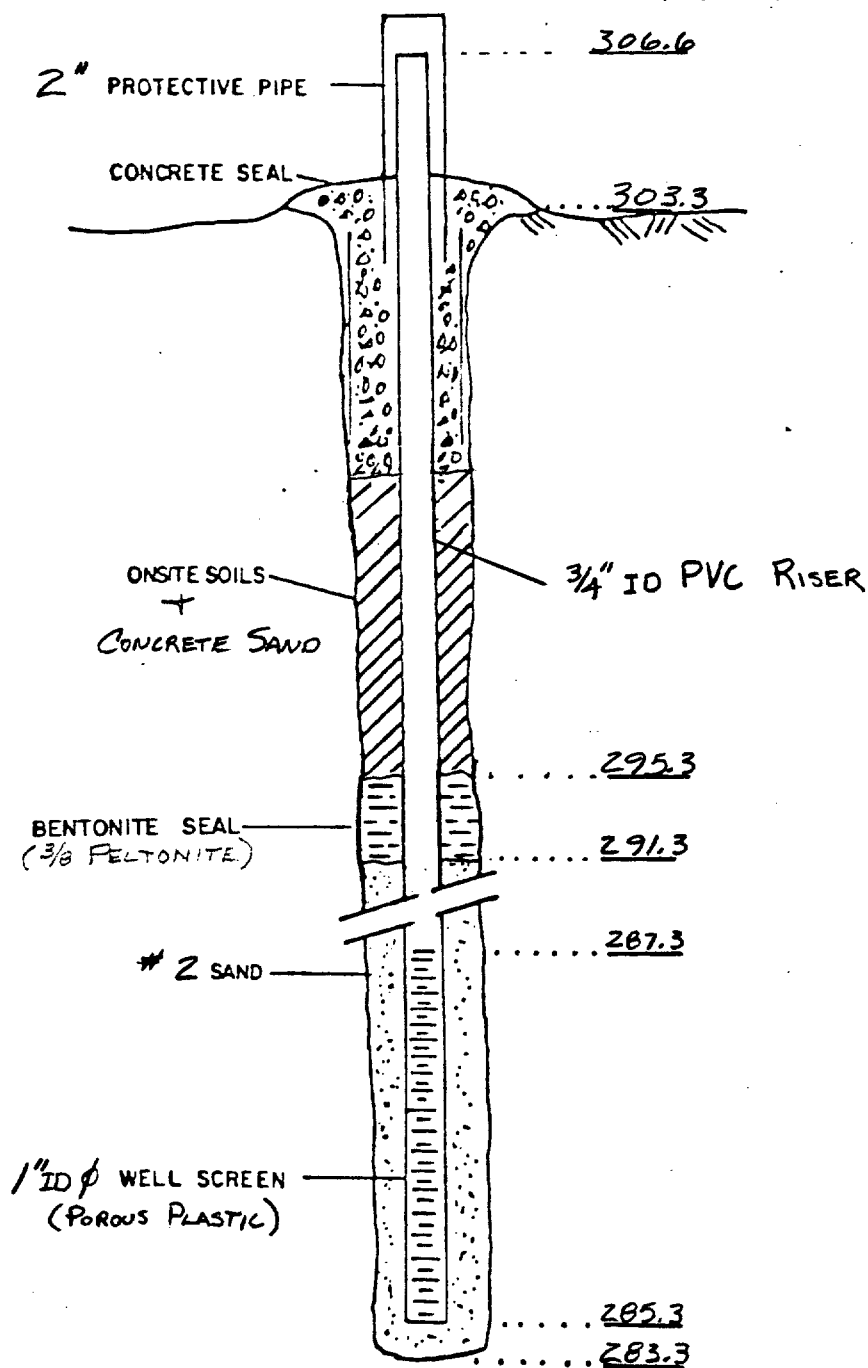
PAGE 7 OF 7

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
PROJECT HOP BROOK DAM, CT
DAM-33-85-D-0011, D.O.#010

REPORT NO. CD 011

WELL NO. FD-86-5

ELEVATIONS



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOP BROOK DAM PROJECT NO. DACW 33-85-D-0011 DO # 010
Page 1 of 8 Pages
Hole No. FD-86-6 Diam. (Casing) 4" Boring Started 3-11-86
Co-ordinates: ^{STA} 4+70.0 ^{OFFSET} 100.9 Boring Completed 3-18-86
Drilled by TODD & DAVIS Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 345.1 ± M.S.L. Casing Left in Place TOTAL 10' Feet
Total Overburden Drilled 56.5 Feet
Elevation Top of ^{CONCRETE} 288.6 M.S.L. 3.1' STICKUP
Elevation Bottom of Hole 286.1 M.S.L.
Total ^{CONCRETE} ~~Rock~~ Drilled 2.5 Feet
Total Depth of Hole 59.0 Feet
Core Recovered 40 %
Core Recovered 0.2 Ft.; 1 1/8 Diam. In.
Soil Samples 2 3/8 In. Diam. 5 No.
Soil Samples _____ In. Diam. _____ No. Water Table Depth _____

Depth		Method of Drilling and Type of Bit Used
From	To	
0	4.5	6" CORE WASHED WITH WATER
4.5	20	3 7/8 ROLLER BIT WASHED WITH WATER FOLLOWED BY DRIVEN 4" CASING
20	58.5	3 7/8 ROLLER BIT WASHED WITH CLEAR MUD
58.5	59	DIAMOND BIT WASHED WITH CLEAR MUD

INDEX	
Ground Water	Back of Page <u>7</u>
Boring Location Sketch	Back of Page <u>7</u>
Overburden Record	Page <u>2-5</u>
Rock Drilling	Page <u>—</u>
<u>WELL INFO.</u>	Page <u>6, 8</u>
	Page _____
	Page _____

Prepared by PAUL FISHER
Field Data

Submitted by ATLANTIC TESTING LAB

Lab. Data

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Site Hop Brook Dam, CT Page 2 of 8 Pages

Boring No. FD-86-6 Desig. FD-F Diam. (Casing) 4'

FIELD LOG OF TEST BORING

Co-ordinates: Sta 4+70.0 Off 100.9'

Elevation Top of Boring 345.1 M.S.L. Hammer Wt. 300 Boring Started 3-11-86
Total Overburden Drilled 56.5 Feet Hammer Drop 1.5'
Elevation Top of ~~Rock~~ ^{CONCRETE} 288.6 M.S.L. Casing Left 3" Boring Completed 3-18-86
Total ~~Rock~~ ^{CONCRETE} Drilled 2.5 Feet | Subsurface Water Date: _____ Page: _____
Elevation Bottom of Boring 286.1 M.S.L. Obs. Well 3/4"
Total Depth of Boring 59.0 Feet Drilled By Todd + Davis
Core Recovered 40 % No. Boxes IN JARS-6 Mfg. Des. Drill AME 45
Core Recovered 0.2 Ft. 1 1/2 Diam. - In. Inspected By: FISHER
Soil Samples 2 3/8 In. Diam. - No. Classification By: FISHER
Soil Samples - In. Diam. - No. Classification By: _____

DEPTH	CORE/SAMPLE			BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	REL.			
1.5					6" ϕ CORE WITH WATER	BOULDERS (RIP RAP)
4.5				NR		
10.0				NR	3 7/8" ROLLER WITH WATER 4" CASING	ASSUMED GRAVELLY SAND (SW-GM) Brown cuttings and wash water
GENERAL REMARKS: NR - Sampling not required NS - No sample recovered generally due to cobbles						

Site HOP BROOK DAM, CT		Boring No. FD-86-6		Page <u>3</u> of <u>8</u>
----------------------------------	--	------------------------------	--	------------------------------

DEPTH		CORE/SAMPLE			BLOWS PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1. Z	NO	SIZE	REC			
	10.0					3 7/8" ROLLER WITH WATER THEN 4" CASING	ASSUMED GRAVELLY SAND (SW-GM)
					NS		Brown cuttings and wash water
	20.0					3 7/8" ROLLER WITH CLEAR MUD	
					NS		
	27.0						

Site

Hop Brook Dam, CT

Boring No.

FD-86-6

Page

4

of

8

DEPTH		CORE/SAMPLE			BLOWS PER FT. CORE RECHY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO. 2	NO.	SIZE	REC.			
27.0						3 7/8" ROLLER WITH CLEAR MUD	ASSUMED GRAVELLY SAND (SW-GM)
30.0					NS		Brown cuttings and wash water
40.0							
42.0		51	2 3/8		117 217 198 223	3" Ø X 2' SPLIT SPOON, 3 7/8" ROLLER WITH CLEAR MUD	BR, MOIST, cmf SAND SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SW-GM)
44.0					NR		

HOP BROOK DAM, CT

FD-86-6

of 8

DEPTH		CORE/SAMPLE		BLOW PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1.2	NO.	SIZE	REC		
	14.0					
	45.0			NS	3" ϕ X 2' SPLIT SPOON, 3 $\frac{3}{8}$ ROLLER WITH CLEAR MUD	BR, MOIST, cmf SAND SOME GRAVEL, LITTLE COBBLE, TRACE SILT (SW-GM)
		S-2	2 $\frac{3}{8}$		83 120 99 116	
	47.0					
				NS		
	48.5					
		S-3	"		72 87 91	BR, MOIST cm SAND (SP)
	50.0					
		S-4	"		74 42 39 61	
	52.0					
		S-5	"		61 58 47 50	
	54.0					
				NS		BR, WET, -cmf SAND LITTLE, COBBLE, TRACE GRAVEL, TRACE SILT (SP)
	56.5					
	58.5					CONCRETE CONDUIT
	59.0	S-6	1 $\frac{1}{8}$	20%	1 $\frac{1}{8}$ CORE WITH CLEAR MUD	
					BORING TERMINATION	

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 3-18-86

LOCATION (STA): 4+70.0 OFFSET FROM CENTER LINE: 100.9' PIEZ NO.: FD-86-6

PIEZ TYPE: 1" ϕ x 2' POROUS PLASTIC DEPTH OF PIEZ: 55.5' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): (SP) SOIL SAMPLE NO.: S-5 BORING DIAM: 4"

METHOD OF INSTALLATION: 3 7/8 ROLLER BIT USING CLEAR MUD

TYPE OF PROTECTION FOR PIEZ: 3" ϕ x 10' LONG PIPE VENT: 1/8 HOLE IN PIPE CAP

GROUND ELEV.: 345.1' ELEV. TOP OF RISER: 348.18 ELEV PIEZ TIP: 289.6

FILTER: #2 SAND FROM ELEV: 286.1' TO ELEV: 301.6

SEAL: 3/8 PELTONITE FROM ELEV: 301.6 TO ELEV: 305.6

INSTALLED BY: TOOD V. DAVIS CONTRACT NO.: DAW 33-85-DW FOREMAN: FISHER

DATE OF INSTALLATION: 3-18-86 DATE OF OBSERVATIONS: 3-21-86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
0900	BEFORE TEST	54.97	1024	30	51.56			
0954	0							
0956	1	23.85						
0959	5	40.96						
1004	10	45.29						

REMARKS: STICKUP 3.1'

TOTAL LENGTH 58.6'

PAUL FISHER
INSPECTOR

Site: HOP BROOK DAM
 Boring No: FD-86-6

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
3/12	0730	10'	10'	DRY	—	
3/13	0730	20'	35	12'	—	DRILL MUD IN HOLE
3/14	0730	20'	56.5	17'	—	" " " "
3/17	1000	20	58.5	27'	—	" " " "
3/18	0730	20	59	23'	—	" " " "
3/19	1030	0	59	DRY	—	PZ SET
3/20	0730	0	59	54.72	—	" "
3/21	0900	8	59	54.97		" "

Note: Depths are in feet below original ground

BORING LOCATION SKETCH

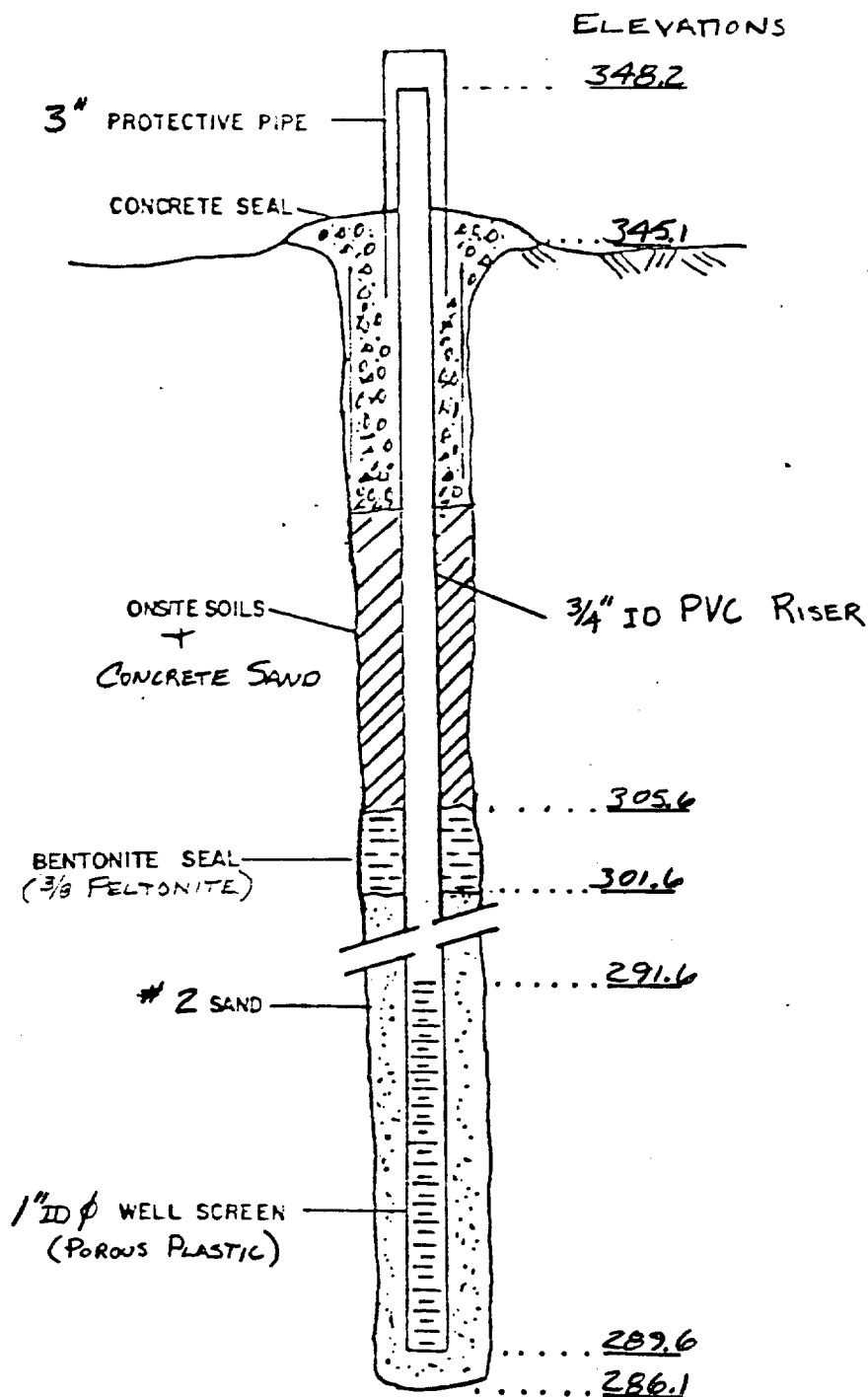
SEE DRAWING

MONITOR WELL
INSTALLATION DETAIL

PAGE 8 OF 8

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
PROJECT HOP BROOK DAM, CT
DAW-33-85-D-0011, D.O.#010

REPORT NO. CD 011
WELL NO. FD-86-6



CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH
FIELD LOG OF TEST BORING

Site HOP BROOK DAM PROJECT NO. DACW 33-85-D-0011 D.O. #010
Page 1 of 10 Pages
Hole No. FD-86-7 Diam. (Casing) 4" Boring Started 3-18-86
Co-ordinates: ^{STA} 3+77.8 ^{OFFSET} 93.1 Boring Completed 3-20-86
Drilled by TODD & DAVIS Report Submitted _____

Purpose of Exploration WAS TO INSTALL OBSERVATION WELL

Elevation Top of Hole 348.1 ± M.S.L.
Total Overburden Drilled 68 Feet
Elevation Top of Rock 280.1 M.S.L.
Elevation Bottom of Hole 278.6 M.S.L.
Total Rock Drilled 1.5 Feet
Total Depth of Hole 69.5 Feet
Core Recovered _____ %
Core Recovered _____ Ft.; _____ Diam. _____ In.
Soil Samples 2 3/8 In. Diam. _____ No.
Soil Samples _____ In. Diam. _____ No.

Casing Left in Place TOTAL 10' Feet
1.8 STICK UP

Water Table Depth _____

Depth		Method of Drilling and Type of Bit Used
From	To	
0	4	6" DIAMOND CORE WITH WATER
4	12	4" DIAMOND TURN CASING WITH WATER
12	69.5	3 7/8" ROLLER BIT USING CLEAR MUD

INDEX	
Ground Water	Back of Page <u>9</u>
Boring Location Sketch	Back of Page <u>9</u>
Overburden Record	Page <u>2-7</u>
Rock Drilling	Page <u>7</u>
<u>WELL INFO</u>	Page <u>8, 10</u>
	Page _____
	Page _____

Prepared by PAUL FISHER
Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

FD-86-7

27.0

Site					Boring No.		Page	
HOP BROOK DAM, CT					FD-86-7		6 of 10	
DEPTH		CORE/SAMPLE		BLOWS PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
	NO.	SIZE	REQ					
44.0					3 7/8" ROLLER WITH CLEAR MUD	ASSUMED GRAVELLY SAND (SP-GM) Brown cuttings and wash water		
50.0			NR					
55.0					3" ϕ x 2' SPLIT SPOON, 3 7/8" ROLLER WITH CLEAR MUD	ASSUMED GRAVELLY SAND WITH COBBLES (SP-GP) (SAMPLING UNSUCCESSFUL) Brown cuttings and wash water		
61.0			NS					

FD-86-7

DEPTH	CORE/SAMPLE			BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
NO. 2	NO.	SIZE	DEPTH RANGE	CORE RECVY		
61.0			NS		3" ϕ X 2' SPLIT SPOON, 3 7/8" ROLLER WITH CLEAR MUD	ASSUMED GRAVELLY SAND WITH COBBLES (SP-GP) (SAMPLING UNSUCCESSFUL) Brown cuttings and wash water
65						
68.0						
69.5			NR		3 7/8" ROLLER WITH CLEAR MUD	BED ROCK Brown cuttings and wash water
					BORING TERMINATION	

PIEZOMETER INSTALLATION REPORT

PROJECT: HOP BROOK DAM DATE: 3-21-86

LOCATION (STA): 3+77.8 OFFSET FROM CENTER LINE: 93.1 PIEZ NO.: FD-86-7

PIEZ TYPE: 1" ϕ x 2' POROUS PLASTIC DEPTH OF PIEZ: 46.8 RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): ASSUMED (SP-GP) W/COARSE SAMPLE NO.: NONE BORING DIAM: 4"

METHOD OF INSTALLATION: 3 7/8" ROLLER BIT USING CLEAR MUD

TYPE OF PROTECTION FOR PIEZ: 3" ϕ x 6' LONG PIPE VENT: 1/8" HOLE IN PIPE CAP

GROUND ELEV.: 348.1 ELEV. TOP OF RISER: 349.85 ELEV PIEZ TIP: 281.3

FILTER: #2 SAND FROM ELEV: 279.4 TO ELEV: 288.9

SEAL: 3/8" PETONITE FROM ELEV: 288.9 TO ELEV: 292.9

INSTALLED BY: TODD & DAVID CONTRACT NO.: DA-N 33-85-D-0011 FOREMAN: FISHER

DATE OF INSTALLATION: 3-20-86 DATE OF OBSERVATIONS: 3-21-86

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
0910	BEFORE TEST	35.98	0943	30	24.89			
0913	0	0						
0914	1	19.02						
0918	5	21.92						
0923	10	24.28						

REMARKS: 1.8 STICK UP68.6' TOTAL LENGTH

PAUL FISHER
INSPECTOR

Site: HOP BROOK DAM
Boring No: FD-86-7

SUBSURFACE WATER OBSERVATIONS

[illegible]

Note: Depths are in feet below original ground

BORING LOCATION SKETCH

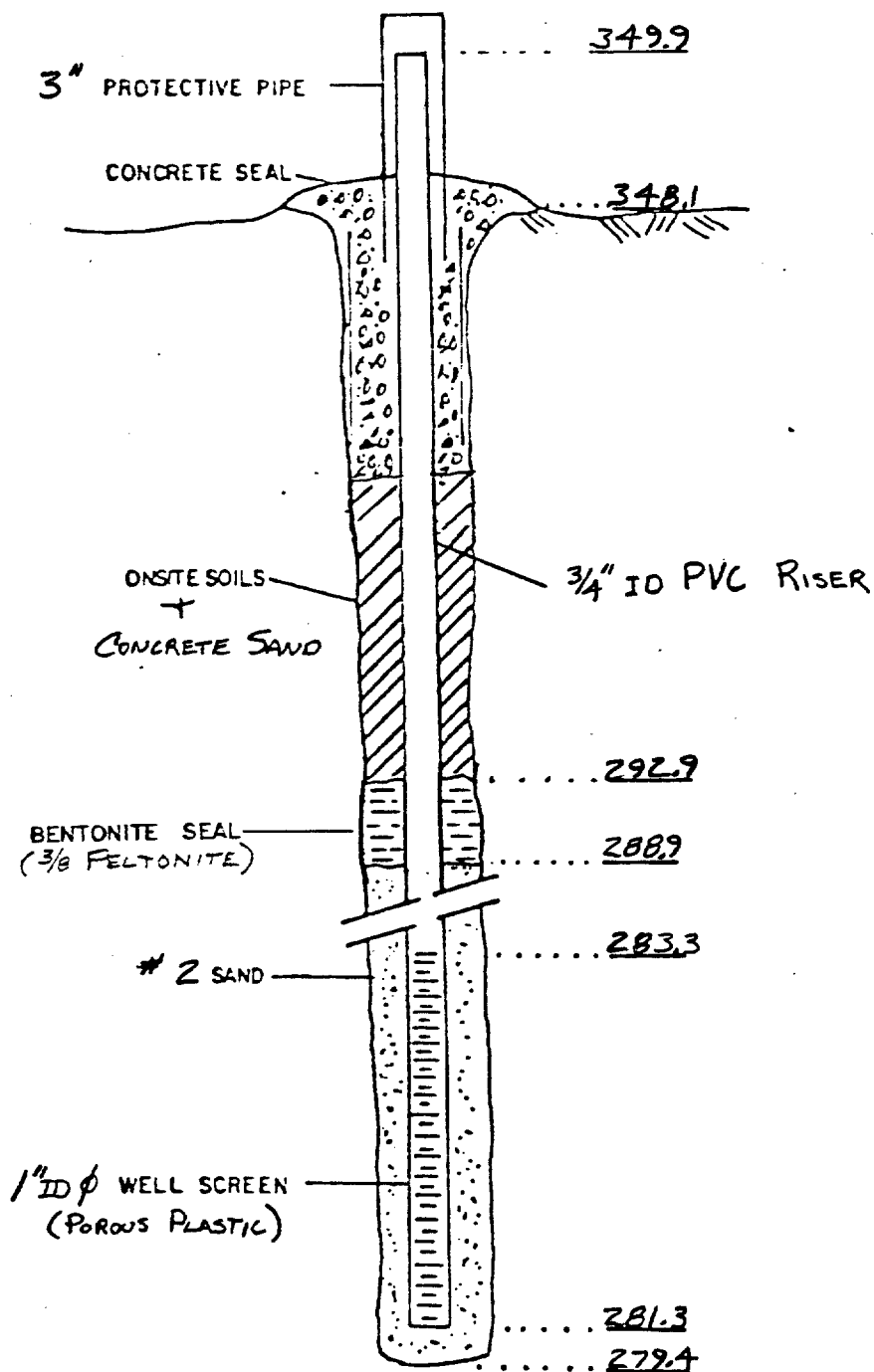
SEE DRAWING

MONITOR WELL
INSTALLATION DETAIL

PAGE 10 OF 10

CLIENT CORPS OF ENGINEERS
NEW ENGLAND DIVISION
PROJECT HOP BROOK DAM, CT
DAW-33-85-D-0011, D.O.#010REPORT NO. CD 011
WELL NO. FD-86-7

ELEVATIONS





atl

ATLANTIC TESTING LABORATORIES, Limited

DAILY PROGRESS REPORT OF DYE TEST READINGS

Date 4-2-86, WEDReport No. CD-011 - Page 1Project HOP BROOK DAM DYERepresentative PAUL FISHER

DATE	TIME	POOL	REMARKS	FD-86-2, PAGE 1 OF
4/2	0852	39.5	(YELLOW DYE) ADDED 1 CRUSHED TABLET + 1 QT WATER + 3 QT WATER	
			OPENED 1 GATE TO 3', \approx 320 CFS, FD-2 @ 9.88m	
	0911	38.2	NO SIGNS OF DYE, EXCESSIVE TAIL WATER	
	1015	38	" "	
	1120	"	" "	
	1215	37.8	" "	
	1450	36.4	" ", PERFORMED DYE TEST IN OPEN WATER	
	1525	36.0	" " MEASURED FD-2 @ 9.89 (NOTE NO DYE	
			ON MEASURING TAPE) GATE TO 3.5', \approx 380 CFS	
			ASSUMED TEST NO GOOD	
4/3	0715	30.3	SHOT GATES TO 1 @ .5' \approx 50 CFS	
	0815	30.3	FD-2 READING @ 9.88m, ADDED 1 TABLET + 1	
			QT WATER PLUS 3QT WATER	
	0845 1245	30.3	NO SIGNS OF DYE	
	1305		"	
	1320		"	
	1410		"	
	1518		"	
	1615	30.0	" STOPPED TEST	

Time Arrived Jobsite _____

Time Departed Jobsite _____

Time Arrived Jobsite _____

Time Departed Jobsite



atl

ATLANTIC TESTING LABORATORIES, Limited

DAILY PROGRESS REPORT

Date 4/04 - 4/05Report No. CD 011 - page 2Project Hop Brook Dam Dye testRepresentative Jersey Fairley

Date	Time	Pool	Remarks
4/04	13:00		Arrived dam @ 12:30, No dye visible
	14:00		No dye visible
	15:00		" " "
	16:00		" " "
	17:00		" " "
	-		Break to check into Hotel
	19:00		No dye visible
4/05	7:00	30.2	Arrived dam @ 6:50 - No dye visible - spillway open
	8:00		No dye visible
	9:00		" " "
	10:00		" " "
	11:00		" " "
	12:00		" " "
	13:00		" " "
	14:00		" " "
	15:00		" " " Added 3 crushed dye tablets (Red) mixed with 3 gts water to well # 6 @ 15:45
	16:00		" " " Added 3 crushed dye tablets (Yellow) mixed w/ 3 gts water to well # 2 @ 16:00
	17:00		" " "
	18:00		" " " left jobsite @ 18:00

Time Arrived Jobsite _____

Time Departed Jobsite _____



atl

ATLANTIC TESTING LABORATORIES, Limited

DAILY PROGRESS REPORT

Date 4/06 - 4/07

Report No. CD 011 p. 3

Project Hop Brook Dam Dye Tests

Representative J. Fairley

Date	Time	Pool	Remarks
4/06	7:00	30.7	Arrived dam @ 7:00 - Spillway opened to 0.2' (≈ 12 cfs)
	8:00		No dye visible
	9:00		" " "
	10:00		" " "
	11:00		" " "
	12:00		" " "
	13:00		" " "
	14:00		" " "
	15:00		" " "
	16:00		" " " left site @ 16:30 - No dye visible
4/07	7:00	31.7	Arrived dam @ 7:00 - spillway opened to 0.5'
	8:00		No dye visible
	9:00		" " "
	10:00		" " "
	11:00		" " "
	12:00		" " "
	13:00		" " "
	14:00		" " "
	15:00		" " " 15:30 - 8 gallons water added to FD-2 + no apparent effect 5 gallons added to FD-6 - filled piezometer to top

Time Arrived Jobsite

Time Departed Jobsite



atl ATLANTIC TESTING LABORATORIES, Limited

DAILY PROGRESS REPORT

Date 4/07 - 4/08

Report No. CD 011 p. 6

Project Hop Brook Dam Dye Tests

Representative Jerzy Fick

Date	Time	Pool	Remarks
4/07	16:00		No dye visible
	17:00		" " "
	18:00		" " " 18:30 - Added 8 gallons water FD-2 - no apparent efft " 5 " " FD-6 - filled piez. to top
	19:00		" " " left site @ 19:00 due to too dark to see the dye
4/08	6:00	30.5'	Arrived dam @ 6:00 - spillway open to 0.5'
	7:00		No dye visible
	8:00		" " "
	9:00		" " "
	10:00		" " "
	11:00		" " "
	12:00		" " "
	13:00		" " "
	14:00		" " "
	15:00		" " "
	16:00		16:00 - Added 8 gallons water FD-2 - no apparent efft " 5 " " FD-6 - filled piez. to top
	17:00		" " "
	18:00		" " "
	19:00		" " " left site @ 19:00, due to too dark to see the dye

Time Arrived Jobsite _____

Time Departed Jobsite _____



DAILY PROGRESS REPORT

Report No. CD 011 p. 4

Representative Jeff Finley

Time Arrived Jobsite

Time Departed Jobsite



Report No. CD 011

Piezometer Readings (if feet)*

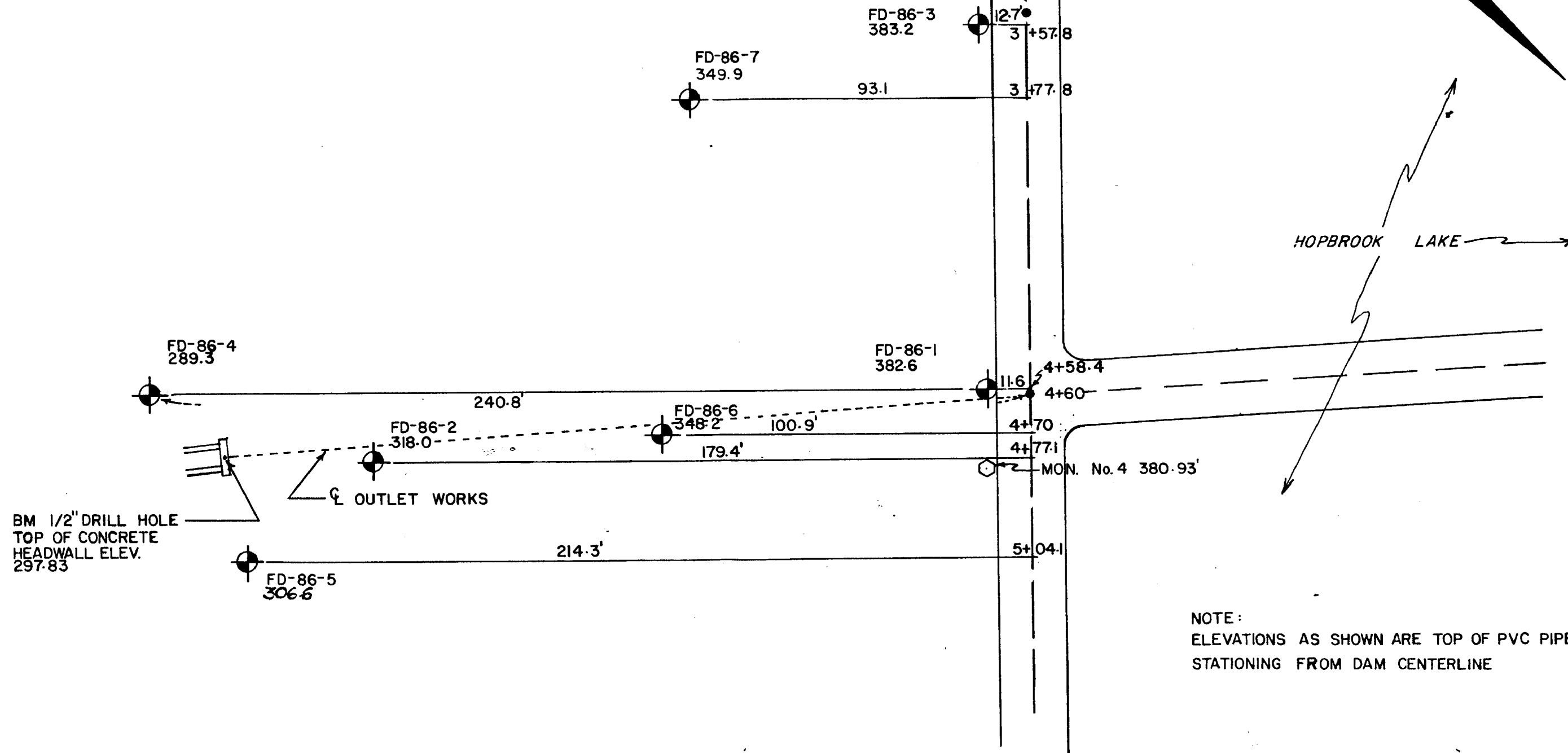
* Note: These readings will differ from Jim DeLong's, because I have subtracted the well-head elevation in each case

Time Arrived Jobsite

Time Departed Jobsite

SECTION 9

OTHER RECORDS TAKEN

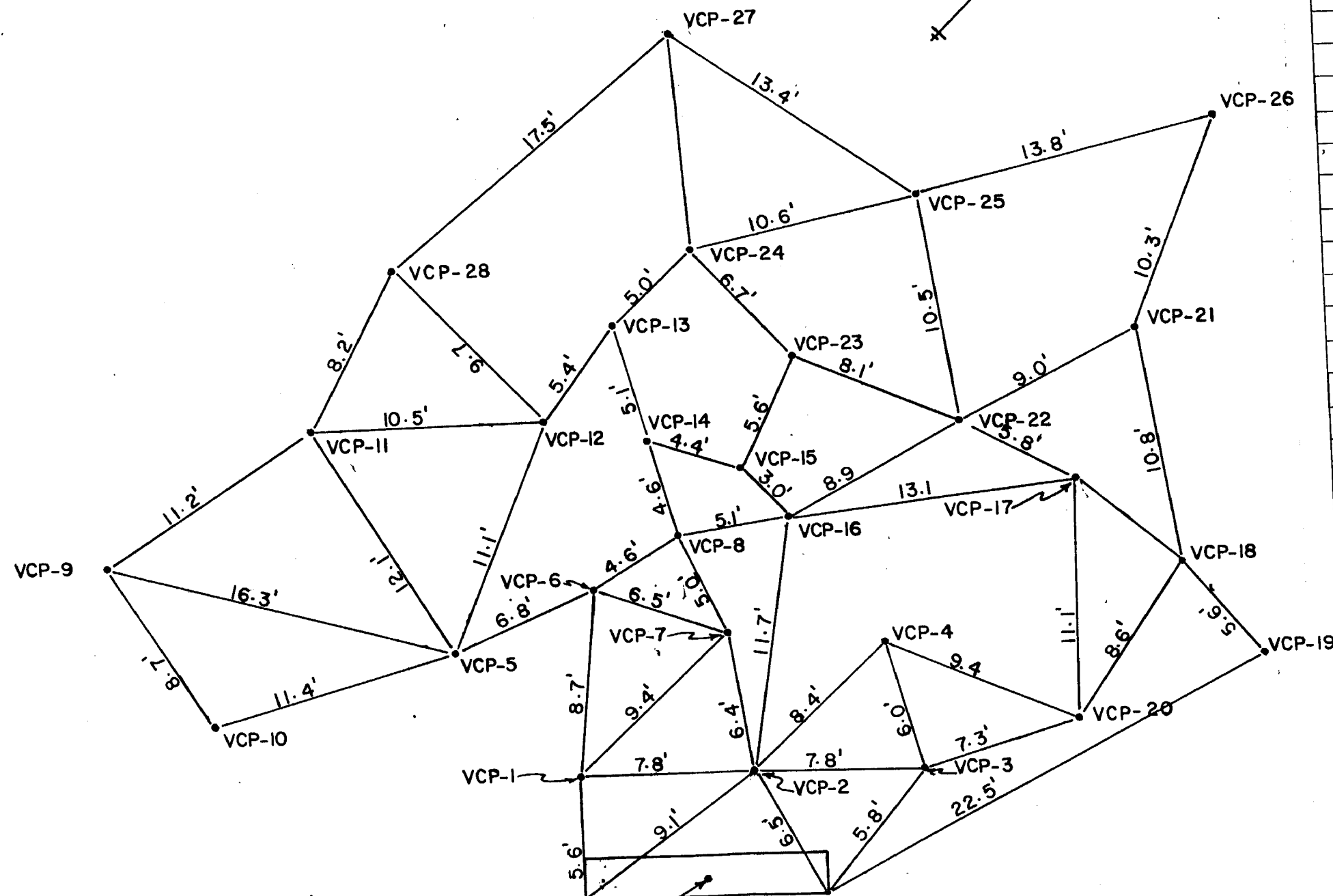


CONTRACT No. DACW 33-85-D-0011
DELIVERY ORDER No. 0010

BORING LOCATION SKETCH
HOPBROOK DAM
HOPBROOK LAKE, CONN.
PROJECT NUMBER
CD-011-2-86

DATE
3-31-86
SCALE
1" = 30'

ATLANTIC TESTING LABORATORIES, Limited
P.O. BOX 29, CANTON, NEW YORK (315) 386-4578
CICERO, N.Y. ENDICOTT, N.Y. BURLINGTON, VT. MANCHESTER, N.H.



VERTICAL CONTROL POINT ELEVATIONS

VCP No.	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
1	297.47	297.47	297.45			
2	298.45	298.44	298.44			
3	298.13	298.19	298.18			
4	302.12	300.11	300.10			
5	300.59	300.59	300.57			
6	301.17	301.18	301.18			
7	300.10	300.09	300.07			
8	301.83	301.82	301.83			
9	302.00	301.99	301.99			
10	298.99	299.00	299.00			
11	304.95	304.93	304.94			
12	305.11	305.10	305.10			
13	306.53	306.52	306.53			
14	304.69	304.70	304.70			
15	303.27	303.27	303.25			
16	302.03	302.02	302.01			
17	301.71	301.71	301.72			
18	302.81	302.81	302.81			
19	302.76	302.75	302.75			
20	298.20	298.19	298.19			
21	306.93	306.95	306.94			
22	305.27	305.25	305.25			
23	306.57	306.56	306.55			
24	308.25	308.27	308.28			
25	309.79	309.78	309.78			
26	311.30	311.29	311.29			
27	312.25	312.24	312.24			
28	308.39	308.40	308.39			

CONTRACT No. DACW 33-85-D-0011
DELIVERY ORDER No. 0010

BM 1/2" DRILL HOLE TOP OF
CONCRETE HEADWALL
OUTLET STRUCTURE
ELEV 297.83
THIS BM WAS SET USING BM No. 4
ON TOP OF THE DAM REFERENCE
ELEV. 380.93

CONTROL POINT SKETCH
HOPBROOK DAM
HOPBROOK LAKE, CONN.

PROJECT NUMBER
CD-011-2-86

DATE
3-31-86

SCALE
1" = 6'

ATLANTIC TESTING LABORATORIES, Limited

P.O. BOX 29, CANTON, NEW YORK (315) 386-4578

CICERO, N.Y. ENDICOTT, N.Y. BURLINGTON, VT. MANCHESTER, N.H.